PIT AND QUARRY

The Cen

APR 3 1942

MARCH, 1942

CONVENTION REPORTS:

National Sand and Gravel, Ready-Mixed Concrete, and Crushed Stone Associations

LUDLOW-SAYLOR

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

for super-severe service

●

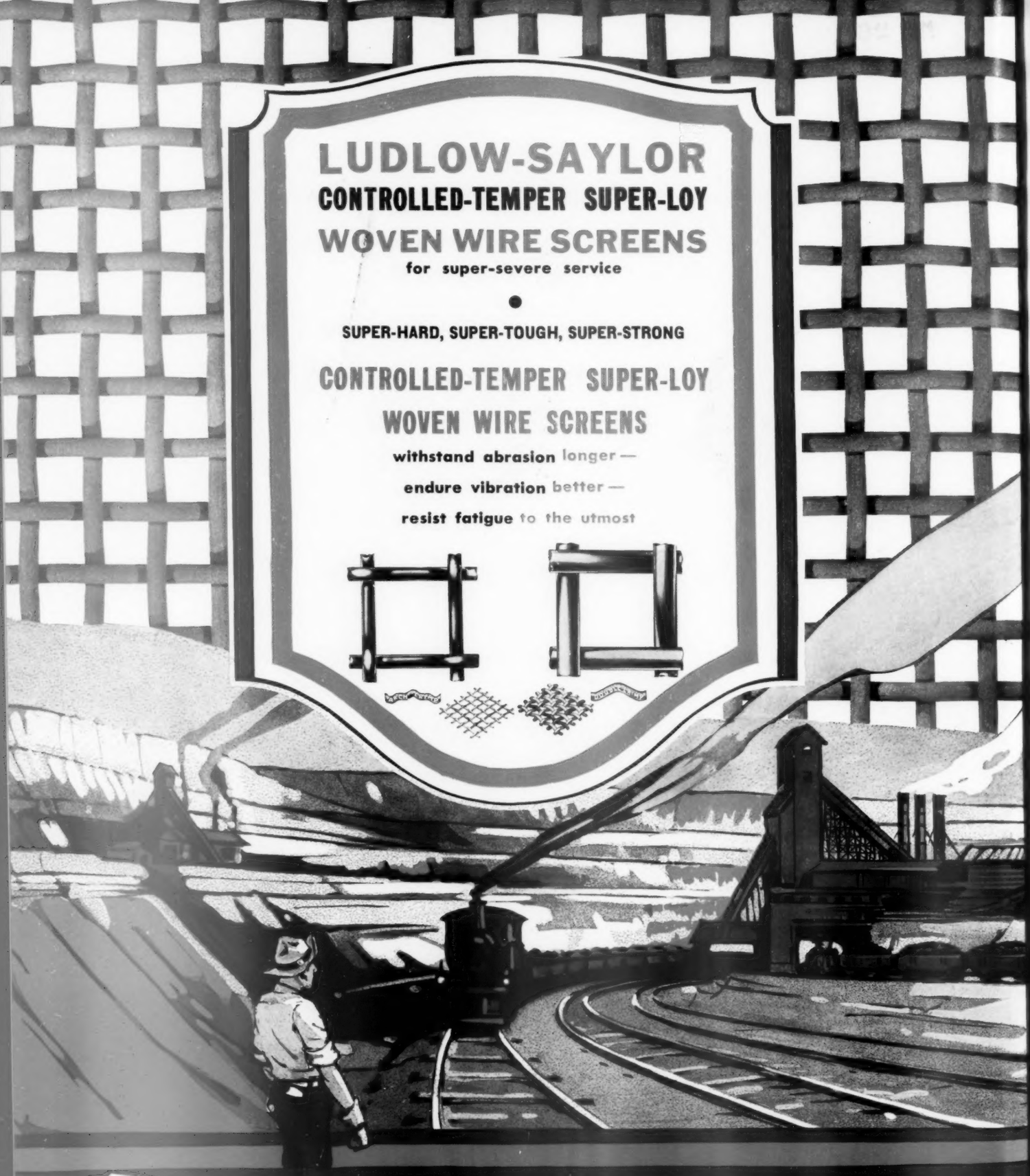
SUPER-HARD, SUPER-TOUGH, SUPER-STRONG

CONTROLLED-TEMPER SUPER-LOY WOVEN WIRE SCREENS

withstand abrasion longer—

endure vibration better—

resist fatigue to the utmost



The background at top of page shows the "Perfect" Double-Crimp Weave.

The small cuts in the center panel compare Arch-Crimp Weave and Double-Crimp Weave.

The border at foot of page shows "Perfect" Double-Crimp Steel Wire Cloth which has been hot-dip galvanized after weaving.

Samples on request.

The LUDLOW-SAYLOR WIRE COMPANY SAINT LOUIS

MAR 26 1942

VETERAN

Except for a certain straightness to his shoulders and a chance remark made a few years ago you'd never know he is a veteran. When he climbed up to the attic that day last December, to dig in the old family memory chest, you know how he felt. Ready when needed. Veteran equipment, too, is ready to carry on where needed.

There's A Long Haul Left in the veteran truck and its veteran tires at your right. Easton Engineers called them fit for duty until new equipment is available. With new 6-8 ton Easton Phoenix hydraulic side-dump bodies two of these veterans are hauling all the stone at an active plant . . . and doing a good, low-cost job.

At the same time, far-sighted planning by the operator has prepared this quarry for a future changeover to modern Easton Semi-Trailers, with modern tractors and modern tires.

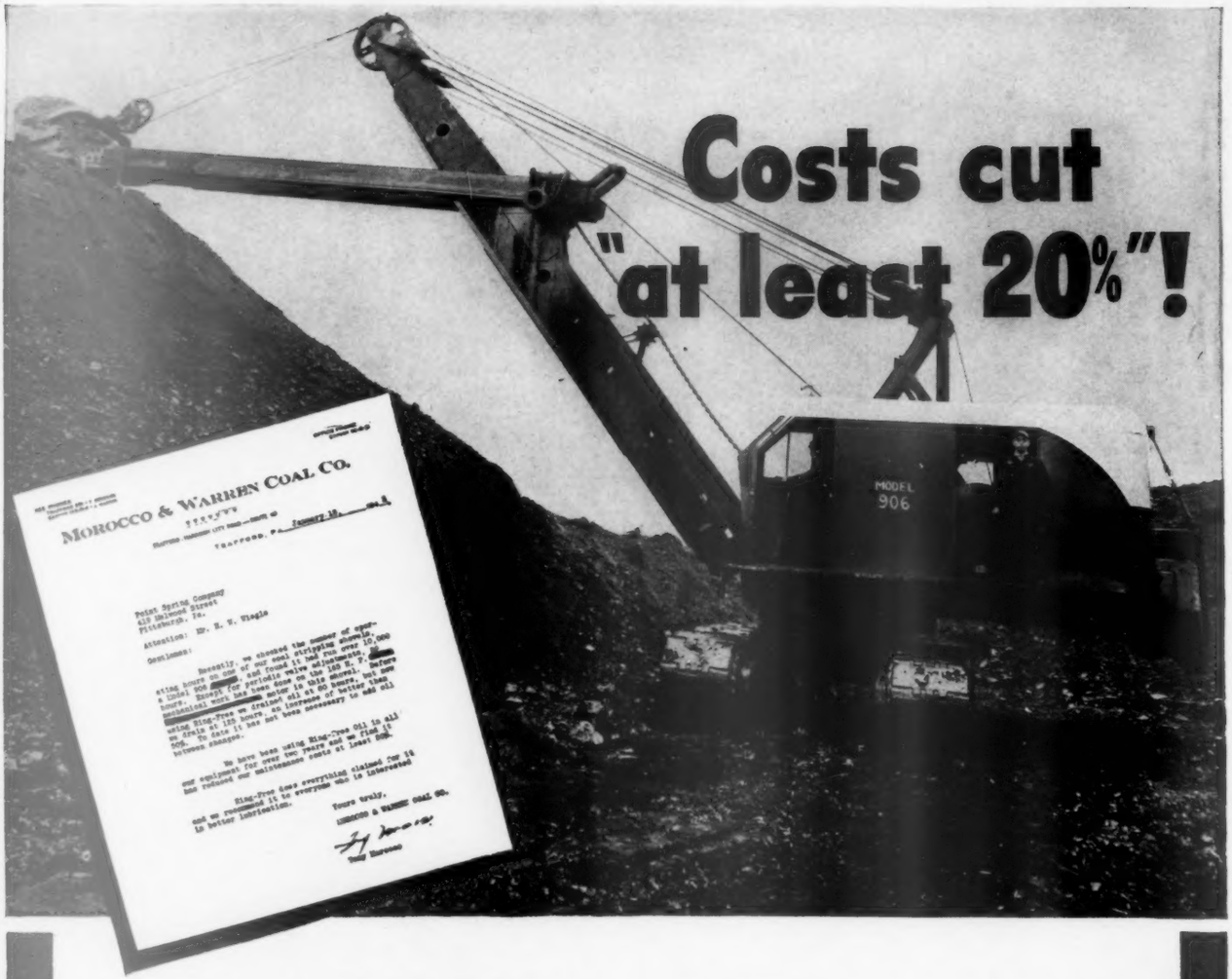
EASTON

CARS · SEMI-TRAILERS · TRUCK BODIES · FOR QUARRY SERVICE

EASTON CAR & CONSTRUCTION CO.
EASTON, PENNSYLVANIA

So that you may haul bigger payloads of stone today—and every day—Easton Engineers are at your service. Several new installations of Easton Semi-Trailer Haulage, Easton Cars, and Easton Truck Bodies, will be made this year. But if you have to wait, remember that the low cost, the high speed, and the big payloads in Easton quarry haulage equipment are **WORTH WAITING FOR.**

PIT AND QUARRY, March, 1942, Vol. 34, No. 9. Published monthly by the Complete Service Publishing Company, 538 South Clark Street, Chicago, Ill. Subscription price $1 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $1 additional for each year. Single copies 25 cents. Entered as second-class matter February 28, 1932, at the Post Office at Chicago, Ill., under the Act of March 3, 1897.



"WE HAVE been using **RING-FREE** in all our equipment for over two years," writes the Morocco & Warren Coal Company of Trafford, Pennsylvania, "and we find it has reduced our maintenance costs at least 20%."

Recently they checked a Model 906 coal stripping shovel and found it had run over 10,000 hours with only periodic valve adjustments on the 165 H. P. motor.

"Before using **RING-FREE** we drained oil at 80 hours, but now we drain it at 125 hours, an increase of better than 50%. To date it has not been necessary to add oil between changes."

Then Tony Morocco adds:

"**RING-FREE** does everything claimed for it and we recommend it to anyone who is interested in better lubrication."

RING-FREE is the *only* oil you need for gasoline engines or Diesels. Think *how* that simplifies your lubricating work!

What **RING-FREE** has done for others it can do for you. Won't you write us?

• • •

MACMILLAN PETROLEUM CORP.
50 West 50th St., New York • 624 So. Michigan Ave., Chicago • 530 West 6th St., Los Angeles

MACMILLAN
RING-FREE
MOTOR OIL

Copyright 1942 by
Macmillan Petroleum Corporation

*It takes the SHOCK OUT OF ROCK

*NEW HYDRAULIC CLUTCH

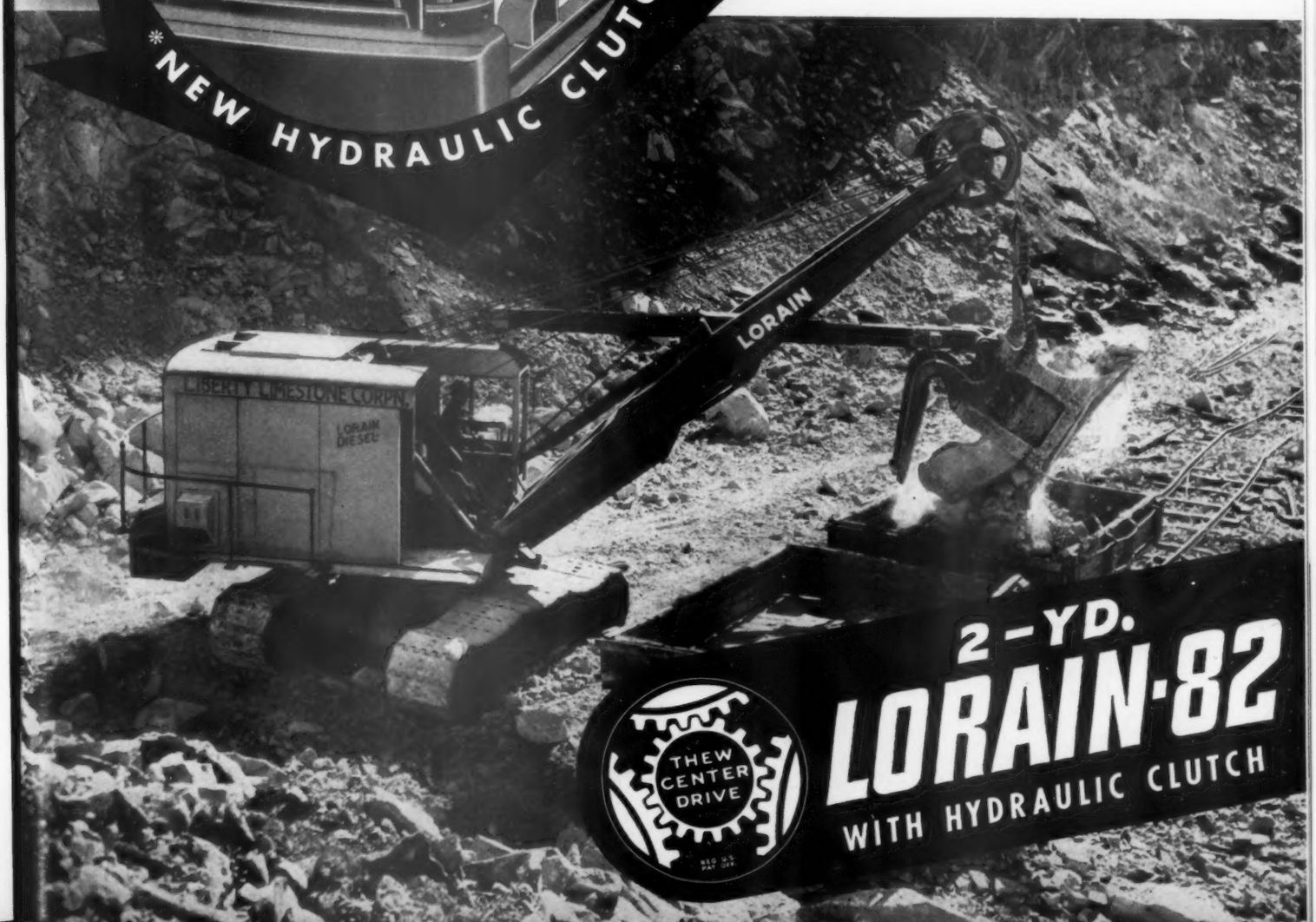
*New Hydraulic Clutch—

(1) Greatly improves "hanging-on" performance
(2) Cushions and protects against severe impacts

The 2-yd. Lorain-82, equipped with hydraulic (fluid) clutch, is the closest approach to a steam machine in smoothness and "never-say-die" power control of any clutch type unit to date. You can't stall the engine under any digging circumstances. The severe shocks and impacts inevitable with rock digging are cushioned and absorbed, eliminating costly stresses and strains on the mechanism and cables. The hydraulic coupling may be "de-clutched" and its drag positively eliminated to stop the machinery for lubrication or adjustment.

You can wade into rock confidently with a Lorain-82 with the assurance that its power and digging force will "hang on" relentlessly until the most unyielding rock is in the dipper—and at the same time the hydraulic clutch will provide an automatic check against destructive impacts and shocks. Write today for complete details on the Lorain-82 and this newest machine-and-money-saving feature.

THE THEW SHOVEL COMPANY
LORAIN, OHIO



THEW CENTER DRIVE

2-YD. LORAIN-82
WITH HYDRAULIC CLUTCH

Defense Savings Pay-Roll Allotment Plan

How company heads can help their country, their employees, and themselves

voluntary pay-roll allotment plan | helps workers provide for the future | helps build future buying power | helps defend America today

This is no charity plea. It is a sound business proposition that vitally concerns the present and future welfare of your company, your employees, and yourself.

During the post-war period of readjustment, you may be faced with the unpleasant necessity of turning employees out into a confused and cheerless world. But you, as an employer, can do something *now* to help shape the destinies of your people. Scores of business heads have adopted the Voluntary Pay-roll Allotment Plan as a simple and easy way for every worker in the land to start a *systematic* and *continuous* Defense Bond savings program.

Many benefits . . . present and future. It is more than a sensible step toward reducing the ranks of the post-war needy. It will help spread financial participation in National Defense among all of America's wage earners.

The widespread use of this plan will materially retard inflation. It will "store" part of our pyramiding national income that would otherwise be spent as fast as it's earned, increasing the demand for our diminishing supply of consumer goods.

And don't overlook the immediate benefit . . . money for defense materials, quickly, continuously, *willingly*.

Let's do it the American way! America's talent for working out emergency problems, democratically, is being tested today. As always, we will work it out, without pressure or coercion . . . in that old American way; each businessman strengthening his *own* house; not waiting for his neighbor to do it. That custom has, throughout history, enabled America to get things done *of its own free will*.

In emergencies, America doesn't do things "hit-or-miss." We would get there *eventually* if we just left it to everybody's whim to buy Defense Bonds when they thought of it. But we're a nation of businessmen who understand that the way to get a thing done is to *systematize* the operation. That is why so many employers are getting back of this Voluntary Savings Plan.

Like most efficient systems, it is amazingly simple. All you have to do is offer your employees the convenience of having a fixed sum allotted, from each pay envelope, to the purchase of Defense Bonds. The employer holds these funds in a separate bank account, and delivers a Bond to the employee each time his allotments accumulate to a sufficient amount.

Each employee who chooses to start this savings plan decides for himself the denomination of the Bonds to be purchased and the amount to be allotted from his wages each pay day.

How big does a company have to be? From three employees on up. Size has nothing to do with it. It works equally well in stores, schools, publishing houses, factories, or banks. This whole idea of pay-roll allotment has been evolved by businessmen in cooperation with the Treasury Department. Each organization adopts its own simple, efficient application of the idea in accordance with the needs of its own set-up

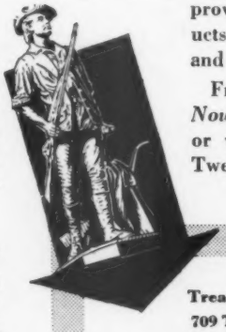
No chore at all. The system is so simple that A. T. & T. uses exactly the same easy card system that is being used by hundreds of companies having fewer than 25 employees! It is simple enough to be handled by a check-mark on a card each pay day.

Plenty of help available. Although this is *your* plan when you put it into effect, the Treasury Department is ready and willing to give you all kinds of help. Local civilian committees in 48 States are set up to have experienced men work with you just as much as you want them to, and no more.

Truly, about all *you* have to do is to indicate your willingness to get your organization started. We will supply most of the necessary material, and no end of help.

The first step is to take a closer look. Sending in the coupon in no way obligates you to install the Plan. It will simply give you a chance to scrutinize the available material and see what other companies are already doing. It will bring you samples of literature explaining the benefits to employees and describing the various denominations of Defense Savings Bonds that can be purchased through the Plan.

Sending the coupon does nothing more than signify that you are anxious to do *something* to help keep your people off relief when defense production sloughs off; *something* to enable *all* wage earners to participate in financing Defense; *something* to provide tomorrow's buying power for your products; *something* to get money *right now* for guns and tanks and planes and ships.



France left it to "hit-or-miss" . . . and *missed. Now* is the time for *you* to act! Mail the coupon or write Treasury Department, Section A, 709 Twelfth St. NW., Washington, D. C.

FREE - NO OBLIGATION

Treasury Department, Section A,
709 Twelfth St. NW., Washington, D. C.

Please send me the free kit of material being used by companies that have installed the Voluntary Defense Savings Pay-Roll Allotment Plan.

Name _____

Position _____

Company _____

Address _____

For Short and Long Hauls..

EUCLIDS are your Best Bet!

Countless millions of tons of ore, rock and heavy excavation have been hauled with unusual speed and economy by Rear-Dump EUCLIDS. On shuttle operations or long hauls . . . on level stretches or steep grades . . . Euclids have proved their ability to haul larger pay loads faster and more efficiently.

With a speed range from 2 to 24 m.p.h. —eight forward speeds, four backward— and full floating double reduction drive axle, Rear-Dump EUCLIDS meet every requirement of power and speed for long or short hauls. Special controls increase usefulness and efficiency of the unit . . . full unobstructed vision of the operator makes travel in either direction easy and safe.

No matter what your hauling problem may be . . . mine, quarry, highway or general construction . . . Euclids are your best bet for efficient performance and time-proven reliability.

The EUCLID ROAD MACHINERY Co. • • Cleveland, Ohio

EUCLID

SELF-POWERED HAULING EQUIPMENT

For EARTH . . ROCK . . COAL . . ORE

CRAWLER WAGONS • ROTARY SCRAPERS • TAMPING ROLLERS

EUCLID THE PIONEER

Make This Simple Test

It Will Show You A REAL SAVING *in Belt Costs!*

As a V-belt bends, you can actually feel its sides change shape! The top of the belt is under tension and grows narrower (see Figure 1, at right). The bottom is under pressure—therefore it widens. These stresses force a straight-sided V-belt to bulge in the sheave groove (Fig. 1), and this produces uneven wear on the belt sides, resulting in shorter life!

Now look at Figure 2. There you see how the concave side of the Gates Vulco Rope exactly corrects this bulging. It insures a perfect fit in the sheave groove with uniform side-wall wear and, therefore, longer life! It insures that the entire side-wall grips the pulley—heavier loads are carried without slippage—belts are saved and power consumption reduced.

Only belts built by Gates are built with the Concave side, which is a Gates patent.

What Happens When a V-Belt Bends

FIG. 1

FIG. 2

THE GATES RUBBER COMPANY

Engineering Offices and Stocks in All Large Industrial Centers

GATES VULCO ROPE DRIVES

Chicago, Ill.
549 West Washington

New York City
215-219 Fourth Avenue

Birmingham, Ala.
405 Liberty National Life Bldg.

Los Angeles, Cal.
2240 East Washington Blvd.

Denver, Colo.
999 South Broadway

Dallas, Tex.
2213 Griffin Street

Portland, Ore.
333 N. W. 5th Avenue

San Francisco, Cal.
2700 16th Street

A DIRECT HIT

in High Capacity and Wide Adaptability for

FINE SIZING

STURTEVANT

Air Separators

YOU can attack difficult air separation problems with the STURTEVANT Centrifugal Air Separator . . . the "Ace of Classifiers."

This is an accurate, durable, and highly economical machine for fine sizing products ranging from 40-mesh to 350-mesh and micron sizes.

STURTEVANT'S great performance "under fire"—when speed-up conditions expose the weak points in ordinary separators—is based upon perfectly controlled particle size and specific surface area, with maximum uniformity of material.

RIGHT ON THE NOSE!

309 Sturtevant Air Separators are now in use in the cement industry alone. All were accepted on approval, none rejected. That's hitting the target!

Write for Information

STURTEVANT MILL CO. HARRISON SQUARE BOSTON, MASS.

—and maybe the boss is RIGHT!

WELL . . . . we don't exactly advocate changing over in the middle of the job. In fact we don't claim the earth for Taylor Spiral Pipe.

We do say that in Taylor Spiral you have a pipe that can efficiently and economically handle a wide range of jobs for which Standard Weight pipe of about *twice its weight* is commonly used. Some of these uses are listed opposite.

Thanks to its lighter weight Taylor Spiral Pipe offers big savings to users. In some sizes and weights, for example, the installed cost is only about half that of Standard Weight pipe. Yet the rugged reinforcing seam and fine construction give Taylor Spiral Pipe ample strength and service life to handle a big percentage of today's pipe jobs.

Sizes range from 4" to 42"; thicknesses from 18 gauge to 6 gauge; joint lengths up to 40 ft. All types of end joints and couplings are available and all kinds of fittings and specials, or complete fabricated assemblies, are produced by Taylor Forge.

Taylor Forge Pipe Catalog 404 may help you save steel and dollars. Write for it — today.

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485
New York Office: 50 Church Street • Philadelphia Office: Broad Street Station Bldg.

● With these Taylor Light Wall Fittings it's easy to make a trim workmanlike job. Special factory-made fabrications are also available.

TAYLOR SPIRAL IS A "NATURAL" FOR

- ▶ High and Low Pressure Water Lines.
- ▶ Low Pressure Steam and Air Lines.
- ▶ Steam and Diesel Exhaust Lines.
- ▶ Vacuum and Suction Lines.
- ▶ Blower Piping.
- ▶ Sand and Gravel Lines.
- ▶ Industrial Gas Lines.
- ▶ Oil and Gas Gathering Lines.
- ▶ Swing Pipe.
- ▶ Spray Pond Piping.
- ▶ Hydraulic Mining.
- ▶ Dredge Lines.

● Other Taylor Forge Products include: WeldELLS and a complete line of other Seamless Steel Fittings for Pipe Welding; Forged Steel Flanges; Forged Steel Nozzles and Necks for boiler and other pressure vessel outlets; Heavy-wall Electric-Weld and Forge-Weld Pipe; Seamless Rolled Steel Rings; Corrugated Furnaces, and similar forged and rolled steel products.

TAYLOR *Spiral* PIPE

TODAY'S TOUGH JOBS CALL FOR TRI-CLAD MOTORS

REG. U.S. PAT. OFF.

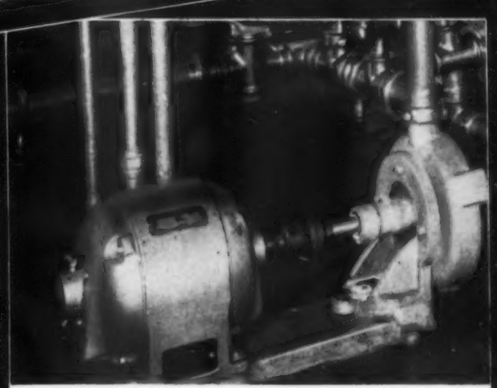
TODAY, you must be sure the motors you buy will give you 24-hour operation, even on the *tough* jobs. Here's where the Tri-Clad motor becomes a real asset. Its cast-iron frame and end shields are a safe-guard against accidental blows. The stator winding is protected against damage from oil, moisture, and heat shock. Improved bearings are enclosed in cast iron, protected against the entry of dust or dirt. Ask your G-E representative for details on types and sizes now available, or write General Electric Company, Schenectady, N. Y.

Now available up to 100 HP in standard, open construction

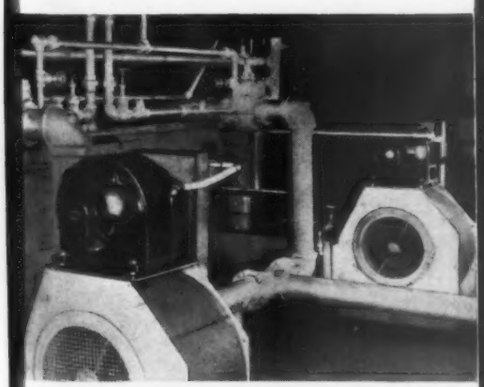
General Electric and its employees are proud of the Navy award of Excellence made to its Erie Works for the manufacture of naval ordnance.

BIG JOB On machines vital to the war effort, Tri-Clad motors are well guarded by their cast-iron frames from metal chips or dripping coolants.

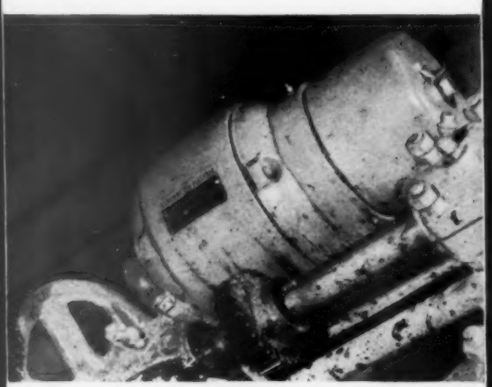
DIRTY JOB Note how dust and fumes have coated this Tri-Clad ball-bearing motor. This is service for which we might not recommend open motors, such as that shown, but we are glad to chalk up this instance of motor stamina under severe operating conditions.



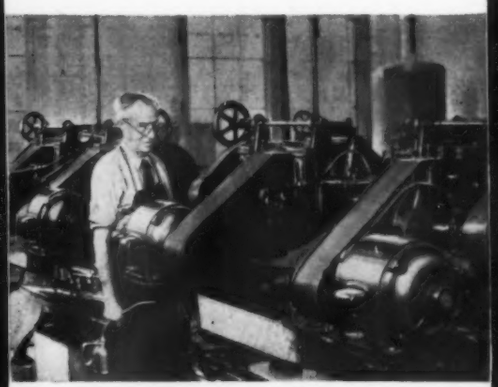
WET JOB Here's a Tri-Clad splash-proof motor close to the floor. Special end shields, watertight conduit boxes, and Formex wire give it *extra* protection against moisture.



HOT JOB These stoker motors are down where red-faced firemen used to sweat. Double-end ventilation and Formex windings with high-heat-transfer advantages give it *extra* protection needed for this service.



HEAVY JOB This Tri-Clad motor is installed on a lift bridge. In these surroundings where grease and grime are ever present, a protective frame is an important factor in continuous operation.



RUSH JOB Here's a Tri-Clad motor at work in the arms industry. The many features of Tri-Clad motors can not only help plants to get important tools into production quickly but will also help keep them in triple-shift operation.

GENERAL ELECTRIC

750-115-8058

More than

100,000 BARRELS

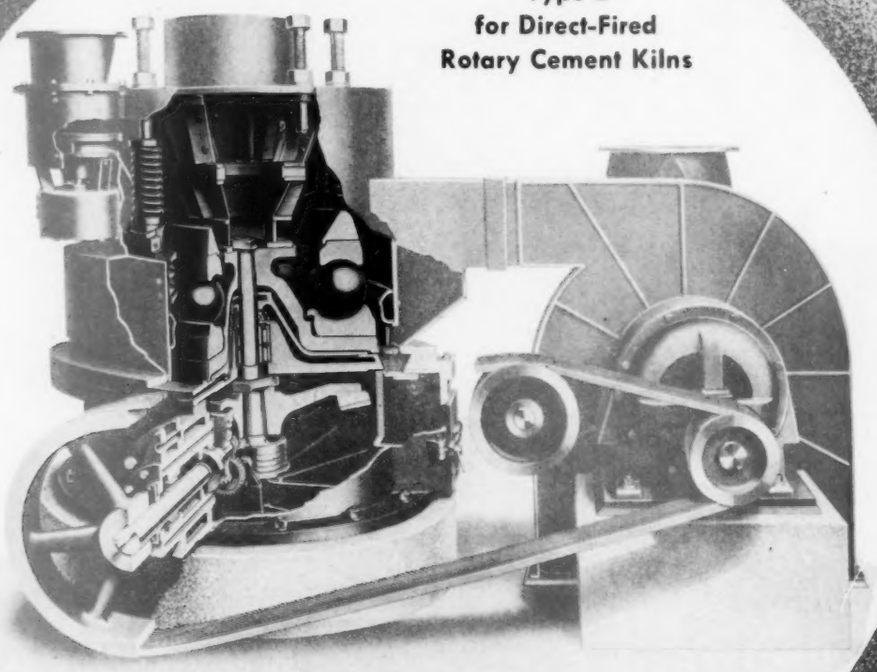
per day is the combined capacity of cement kilns using B&W Direct-Firing Pulverizers

The vast experience in design, manufacture and installation of direct-firing pulverizers, that made possible this substantial capacity, is available to cement plants in which continuous operation is a vital factor today.

THE BABCOCK & WILCOX COMPANY

85 LIBERTY ST., NEW YORK, N. Y.

B&W PULVERIZER
Type E
for Direct-Fired
Rotary Cement Kilns



BABCOCK & WILCOX

C-43

WHEELS MUST BE KEPT TURNING FOR VICTORY

IN your own "all-out" effort to meet the pressing problems of design and production you are invited to make use of any small part the Jones organization might be able to play in helping you to keep the wheels turning for victory.

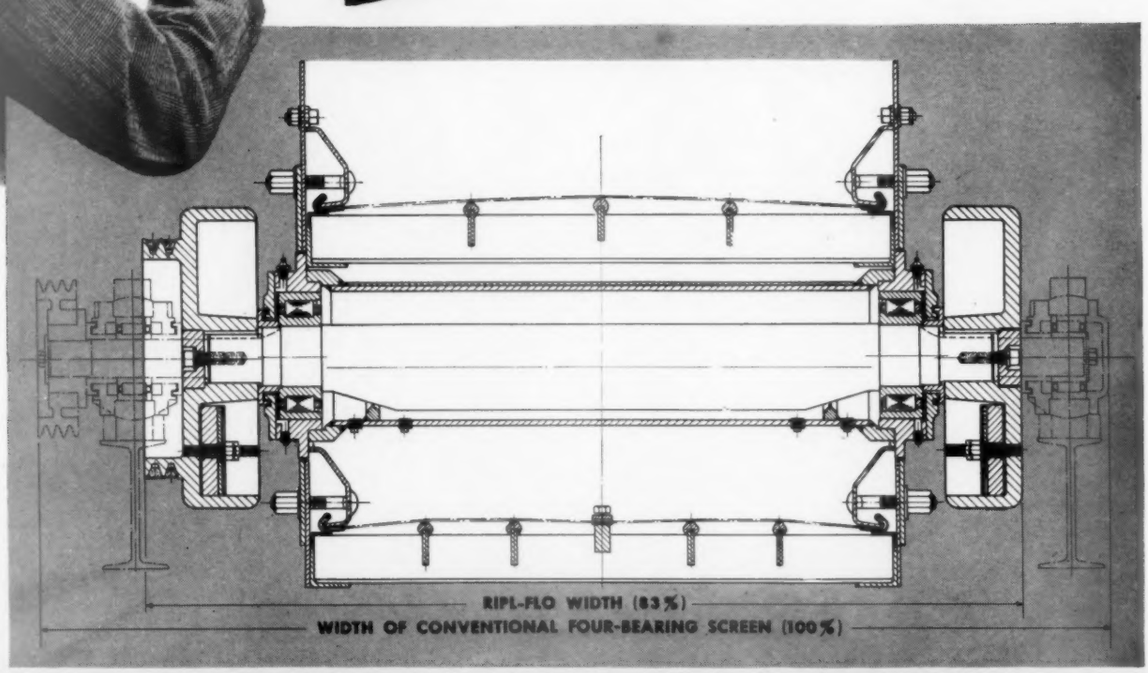
Our Bulletin No. 80 "Jones Drives for Industry" may be helpful to you in giving you a complete picture of the Jones products, engineering services and manufacturing facilities that are available. Your request will bring a copy.

W. A. JONES FOUNDRY & MACHINE CO., 4441 Roosevelt Road, Chicago, Ill.

Jones

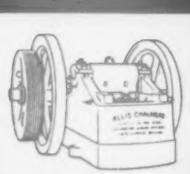
HERRINGBONE — WORM — SPUR — GEAR SPEED REDUCERS • PULLEYS
CUT AND MOLDED TOOTH GEARS • V-BELT SHEAVES • ANTI-FRICTION
PILLOW BLOCKS • FRICTION CLUTCHES • TRANSMISSION APPLIANCES

WHY USE 4 BEARINGS WHEN 2 WILL DO THE JOB?



NEW RIPL-FLO CONstruction eliminates two outer bearings . . . reduces width 17%, weight 36%. This means lower first cost and power consumption, easier installation and accessibility.

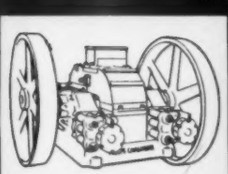
Get "All Out" production with ALLIS-CHALMERS



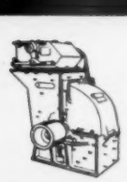
Jaw Crushers—Primary and Fine Reduction

Large Gyratory Crushers Up to 60 in.

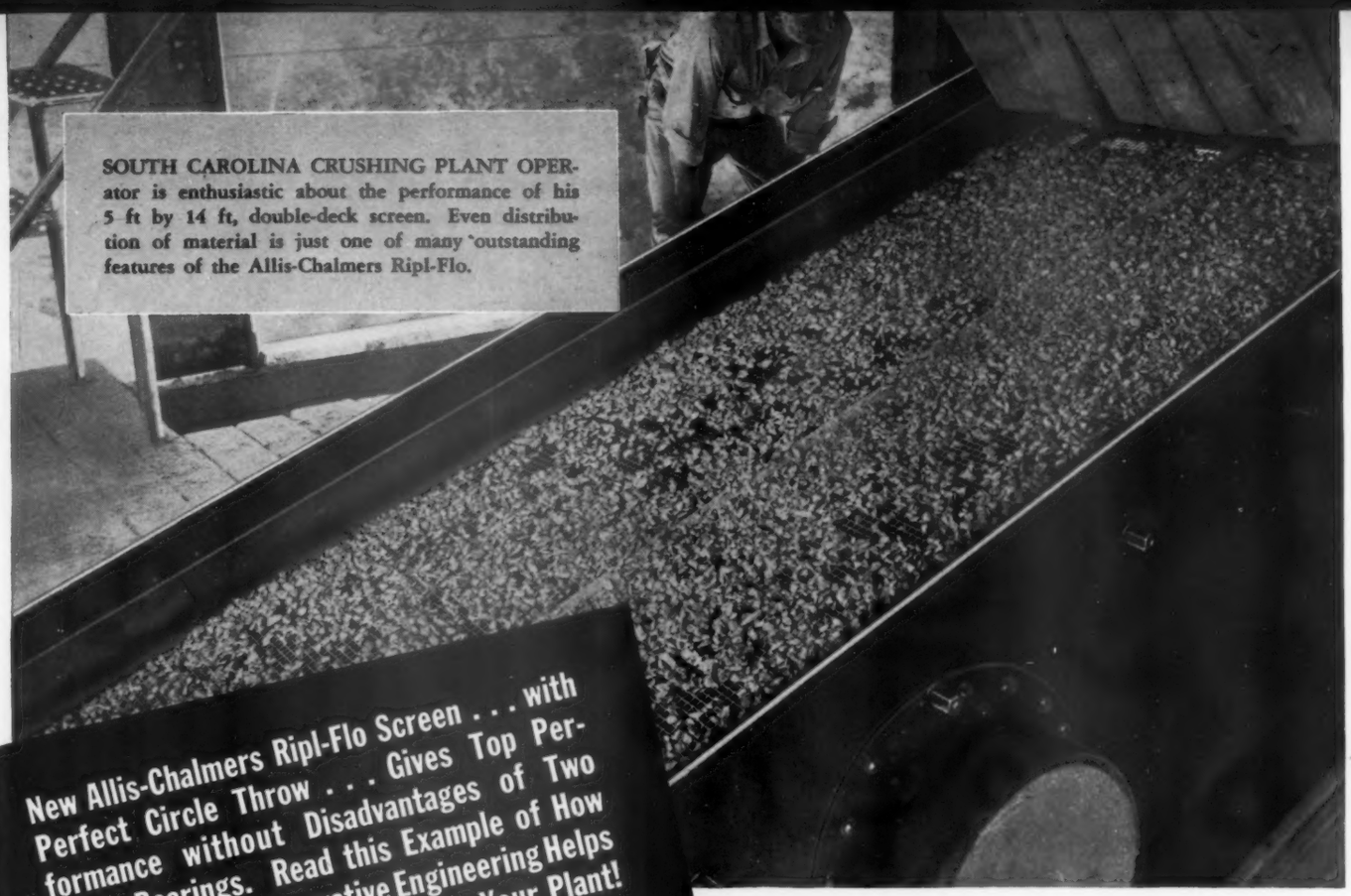
Type "R" Crusher with "Speed-Set" Control



Crushing Rolls for Granular Products



Pulverators (Multi-impact Hammer Mills)



SOUTH CAROLINA CRUSHING PLANT OPERator is enthusiastic about the performance of his 5 ft by 14 ft, double-deck screen. Even distribution of material is just one of many outstanding features of the Allis-Chalmers Ripl-Flo.

New Allis-Chalmers Ripl-Flo Screen . . . with Perfect Circle Throw . . . Gives Top Performance without Disadvantages of Two Outer Bearings. Read this Example of How Allis-Chalmers Cooperative Engineering Helps You Get "All-Out" Production in Your Plant!

Top four-bearing performance *without the disadvantages of the two outer bearings!* That's the secret of the constantly growing demand for the new Allis-Chalmers Ripl-Flo . . . the screen with perfect circle throw!

When the Allis-Chalmers screening engineers designed this remarkable new screen, they eliminated all superfluous parts . . . *reduced the over-all width 17% . . . slashed the weight 36%!* Figure out for yourself what this means to you in lower first cost . . . reduced power consumption . . . ease of installation and accessibility!

Perfect Circle Throw Increases Capacity!

What's more, Ripl-Flo's perfect circle throw transmits vibration evenly to every square inch of the screen cloth. There is no damping of vibration even under the heaviest loads. And the constant rate of travel over the entire deck gives you maximum capacity and efficiency.

Equally important, the Ripl-Flo Screen has no violent shaking action . . . material is *rolled* over and over . . . degradation is reduced to a minimum. There is *no blinding* . . . even in screening fine, damp material!

"All-Out" Production With Cooperative Engineering!

Whenever a production problem comes up in your plant, call on Allis-Chalmers Cooperative Engineering to help you work it out. Let our trained engineers help you adapt existing equipment to the peak demands of the War Program.

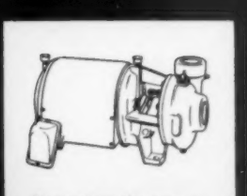
Working with your own staff, they put their broad experience at your disposal . . . help give you the "all-out" production so necessary for Victory! For complete information, call the district office near you. Or write direct to Allis-Chalmers, Milwaukee. A 1491

COOPERATIVE ENGINEERING

Low-cost, High-capacity Ripl-Flo Screen

Rotary Scrubber Screens—Complete Washing Units

Sand Washers—Materials Up to ½" Ring Size



Electrifugal Pump — Compact, Low-cost

Lo-Maintenance Motors, Texrope V-Belt Drives

PUNCHED for Extra Punch

Here you see the beginning of a successful blasting operation. The powder man is punching a hole through a cartridge, preparatory to inserting Primacord.

Primacord-Bickford is a *Detonating* Fuse which in turn must be detonated. It consists of a core of powerful explosive, encased in a waterproof textile covering. It is light, flexible, strong—and insensitive to ordinary shock. It may be used with equal effectiveness on small jobs or giant blasts. Every cartridge, in one hole or a thousand, can be exploded practically simultaneously with Primacord for its explosive wave travels at 3.85 miles per second. Thus each cartridge "goes" with the extra force of a primer cartridge, resulting in better blasting. Send for the Primacord booklet.

THE ENSIGN-BICKFORD COMPANY • SIMSBURY, CONN.

Manufacturers of Safety Fuse since 1836

PB-42

PRIMACORD-BICKFORD DETONATING FUSE

TIME SAVED *will Win the War*

LOADING

HAULING

For Faster Hand Loading

DEMPSTER DUMPSTER BuckeTrux

DUMPING

The cycle of production and distribution must—and *will be*—speeded up, if we are to save those minutes NOW which will both determine the length of the war, and decide the victory.

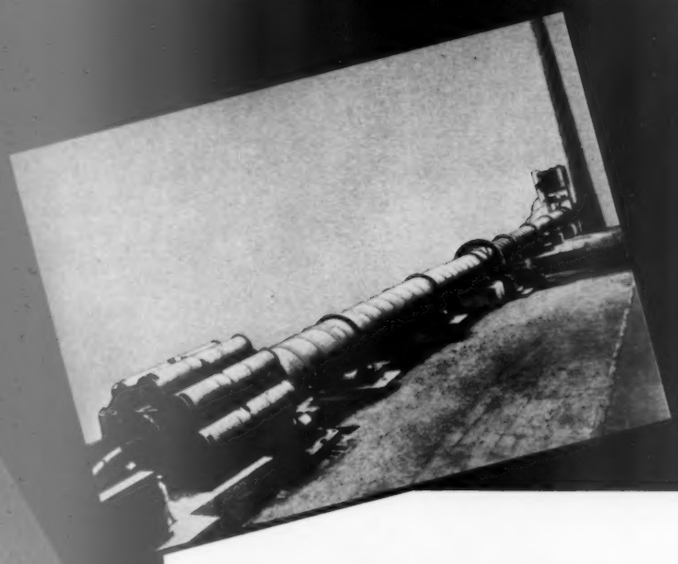
In every operation involving hand loading, DEMPSTER-DUMPSTERS accelerate the flow of vital materials and conserve labor-energy—major contributions to the nation's efforts.

DEMPSTER-DUMPSTER is a standard unit, handling all types of buckets interchangeably, including Drop-Bottom, Skip and Tilt Type.

It is available in sizes from 1½ cu. yds. to 4 cu. yds., inclusive, with net payloads of 4,500 to 12,000 lbs.

Write for Information

DEMPSTER BROTHERS, INC. KNOXVILLE, TENNESSEE

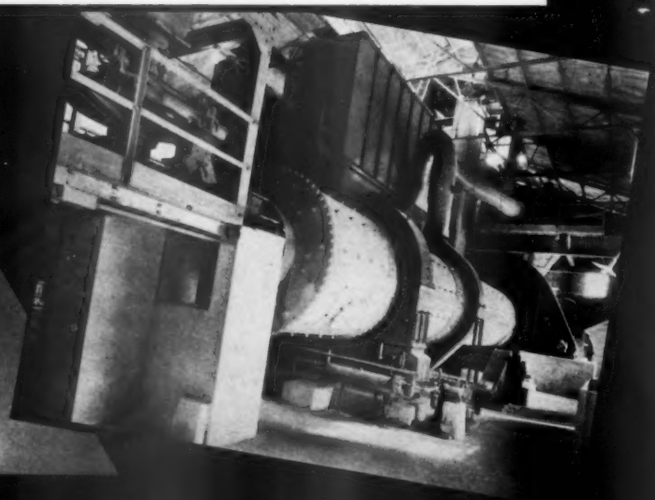


ROTARY KILNS

Machinery for Cement-Lime-Ore

In addition to a complete line of Rotary Kilns and Grinding Mills, F L. Smidth & Co. also manufacture Coolers, Pre-Coolers, Pre-Heaters, Recuperators, Air Separators, Agitators, Packers, Extractors, Feeders, Burners, etc. and their auxiliary equipment, for the manufacture of Cement, Lime, Ores, and Allied Products

GRINDING MILLS

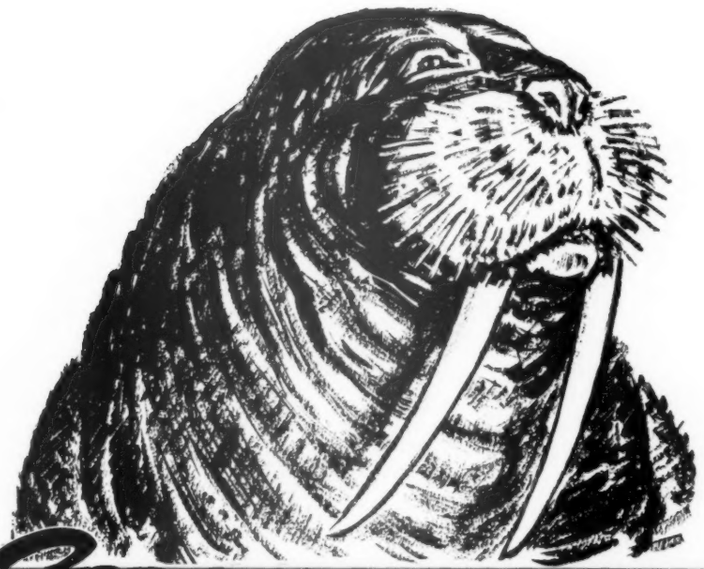


F. L. SMIDTH & CO.

60 EAST 42ND STREET

CEMENT ENGINEERING
CEMENT MACHINERY

NEW YORK, N. Y.



STRONG AS A WALRUS...

supple as a seal

Rugged durability is combined with smooth, easy handling in Bethlehem Purple Strand Form-Set Wire Rope.

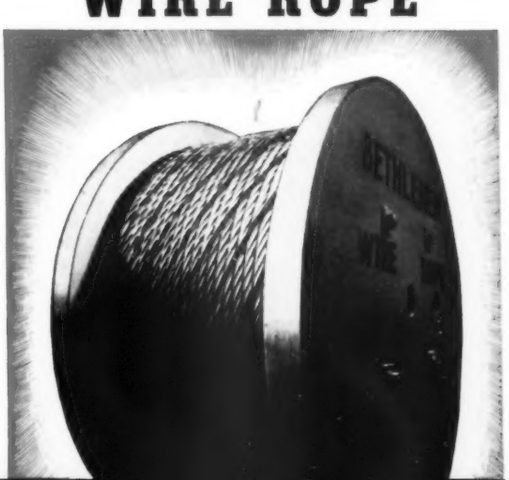
The Purple Strand means that the rope is made of 100 per cent improved plow steel—the toughest, strongest steel used in commercial wire rope.

The Form-Set (preformed) construction means that the rope is limber, relaxed, easy to handle. Can be cut or spliced without seizing. Broken wires don't bristle. The rope is unusually well able to stand bending without premature fatigue.

Next time you buy wire rope—make it Purple Strand Form-Set. You'll be getting a combination of strength and flexibility that's hard to beat.

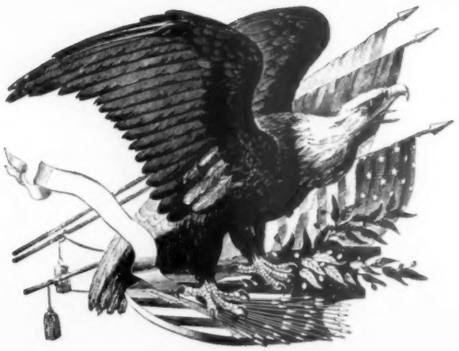
Today wire rope is the sinew of war production. For efficiency—use Purple Strand Form-Set.

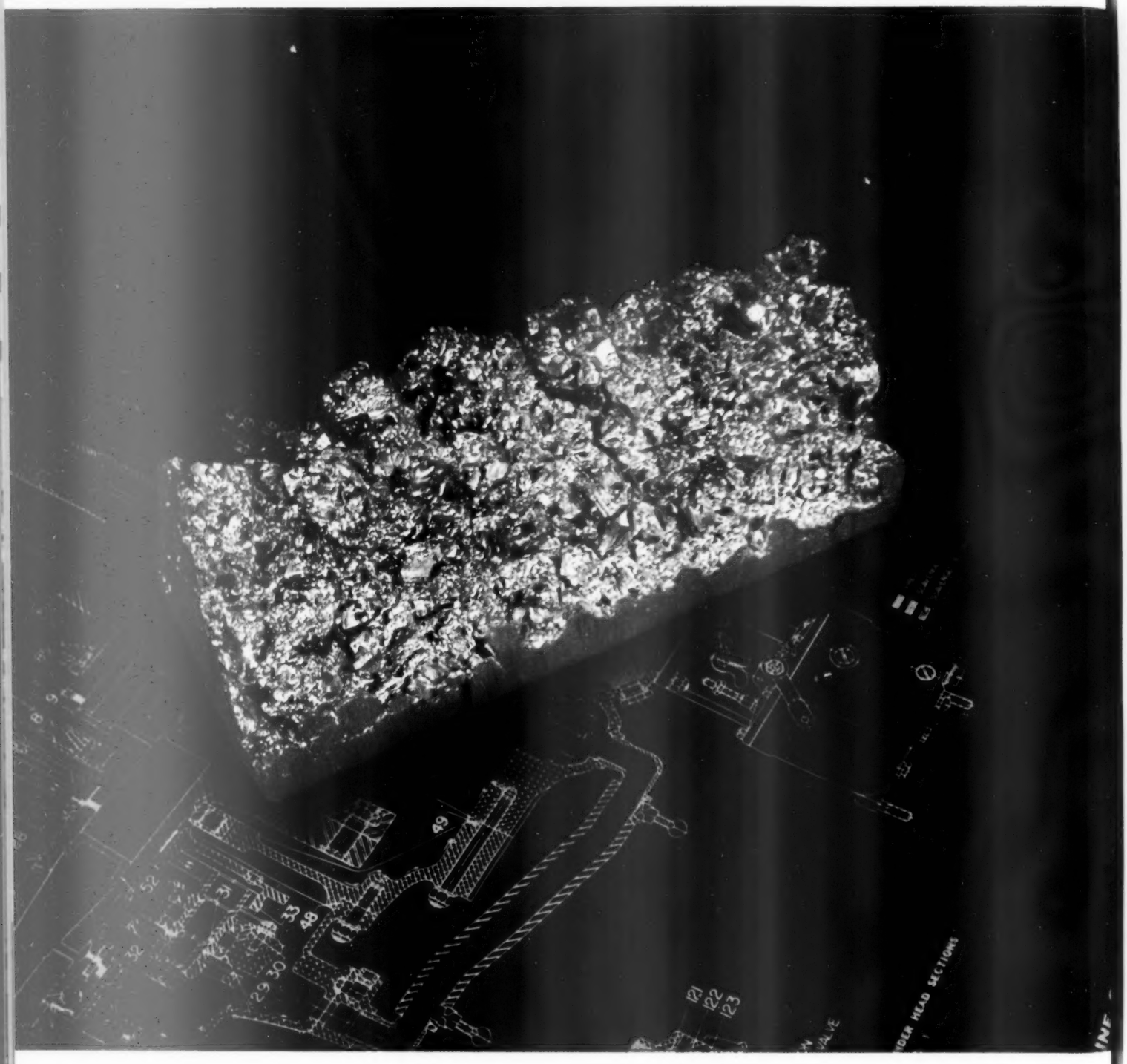
PURPLE STRAND
FORM-SET
WIRE ROPE



BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY





American Cyanamid Company

Declaration of Independence

This block of metallic magnesium from a new American plant symbolizes America's expanding production of strategic metals and its growing independence from sources which can no longer be counted upon to supply the increasing needs of American industry. Even before this page is printed, magnesium metal from this new source may be winging its way over a trackless ocean as a vital part of a Flying Fortress!

Magnesium is only one of many strategic metals which must be made available in undreamed of quantities. Not only metals such as Tin, Chromium and Tungsten not previously produced in quantity by American concentrators, but also American production of non-metallics like Fluorite, Barytes, Limestone, Refractory Materials, Mercury, Mica, Graphite and Garnet must be increased quickly and to unprecedented quantities. This can only be done by using the most efficient modern concentration processes.

Most efficient within its field of application is Heavy-Media Separation (Sink-Float), alone or in combination with froth flotation. When designed from experience gained on large-scale operations and after adequate test work in a well-equipped ore-dressing laboratory, Heavy-Media Separation plants can be built quickly and inexpensively. Being almost entirely assembled from standard units of milling equipment, they can be put into commercial operation with a minimum of lost-time and with operating costs lower than any other modern concentrating process. Particularly because a wide variety of heavy media—both ferrous and non-ferrous—can be used. Heavy-Media Separation has great scope and flexibility of application.

The addition of Heavy-Media Separation to an existing flow scheme offers a proven, low-cost method of pre-concentration of mill feed to produce larger metal-output from existing concentration equipment, or, an economic process for concentrating sub-ores and waste products hitherto regarded as too low-grade for treatment. In addition, Heavy-Media Separation may produce savings in mining costs by permitting less selective and lower cost mining methods. Laboratory and mill results indicate that Heavy-Media Separation may have wide applicability in producing directly a marketable concentrate. This should be particularly interesting to producers of strategic non-metallics.

To determine the economic application of Heavy-Media Separation, froth flotation or combinations of these processes, Cyanamid offers the entire mining industry the services of the expanded Cyanamid Ore Dressing Laboratory, the experience of Cyanamid Field Engineers and its practical operating background gained in treating millions of tons of diverse ores by these processes.

A new edition of Ore Dressing Notes—now in preparation—describes the Heavy-Media Separation Processes offered by Cyanamid. A copy will be sent upon request.

30 Rockefeller Plaza, New York, N. Y.

Printed in U.S.A.

PIONEER
Foto Facts
No. 14

WITH INCREASED DEMANDS FOR DEFENSE PROJECTS, PAUL FRANK REQUIRED MORE PRODUCTION AND BETTER CONTROL OF QUANTITIES OF EACH SIZE.

300,000 TONS CRUSHED ROCK IN ONE SEASON

PAUL FRANK
GENERAL CONTRACTOR
NORTH VERNON, INDIANA

Pioneer Engineering Works, Inc.
1515 Central Ave.,
Minneapolis, Minn.

Gentlemen:

In January, 1939, I started re-modeling my plant and installing Pioneer equipment. Since that time I have installed new Pioneer Crushers, Screens and Conveyors and replaced every old Crusher and Screen with Pioneer equipment. My plant is now 100% Pioneer equipped.

Thanks to Pioneer, I was ready to take care of the increased demands for crushed rock for Defense Projects. I have produced over 300,000 tons of rock this year without shut-downs, delays, or trouble of any kind.

I am glad to recommend Pioneer Crushers, Screens, Conveyors and Quarry Equipment to the commercial producer.

Yours very truly,
Paul Frank
Paul Frank

Here's how Paul Frank, large commercial quarry operator at North Vernon, Indiana, again stepped up his output of crushed rock and agricultural limestone.

He installed a Pioneer 30"x42" Primary Jaw Crusher, 3 new Pioneer Vibrating Screens and another Pioneer 40"x22" Roll Crusher.

A 100% Pioneer equipped plant . . . and read what Paul Frank has to say about it.

PIONEER ENGINEERING WORKS
1515 CENTRAL AVENUE · MINNEAPOLIS, U. S. A.

3 Ways To BEAT ROCK COSTS

Use LeTourneau Rooters, 'Dozers and Carryalls . . . Like Weirton Construction Company Does . . . On Your Toughest Stripping Jobs

Like Weirton Construction Company, scores of alert, profit-minded earthmovers have discovered that LeTourneau Carryalls, Rooters and 'Dozers eliminate the need for extra equipment on rocky jobs like this. They're built extra-rugged by LeTourneau all-welded steel construction, electric arc-welded throughout, to profitably handle hardpan, shale and gumbo with a minimum of lost time.

LeTourneau Carryall Scrapers, for instance, handle the toughest material without undue body strains, twisting, distortion or buckling, because they're built like a box. Sides and ends are stoutly welded together by rugged overhead "A" frame, spring pipe and bracing, which eliminate the inherent weakness of ordinary open-body type scrapers. With Rooters and 'Dozers, rugged LeTourneau construction means long, low-cost equipment life . . . more profit for you. To slash stripping costs on all your jobs . . . get in touch with your LeTourneau-"Caterpillar" dealer TODAY!

ROOTER SAVES BLASTING

To cut stripping costs on this rocky pit, near Weirton, West Virginia, the Weirton Construction Company used this LeTourneau extra-heavy-duty Rooter . . . with it broke up hard compacted shale and decomposed hardpan for easy Scraper loading . . . thus, saved blasting, did the job quicker, cheaper and safer.

ANGLEDOZER DOES DOUBLE DUTY

A LeTourneau Angledozer, used in combination with the Rooter on the same "Caterpillar" D8 tractor, 'Dozed the short hauls . . . was also used as a booster rig to pusher load broken rock into LeTourneau extra-capacity (30 heaped yards) Model N Carryall Scrapers.

CARRYALLS DIG, HAUL, DUMP ROCK

Two of these big Carryalls moved the rock over the long hauls. Each Carryall, pulled by a "Caterpillar" D8 tractor, was pusher loaded to capacity in from 1 to 1¾ minutes. The pulling tractor easily hauled and dumped the big loads. Thus, with this profit-assuring LeTourneau stripping method, Weirton Construction Company took off the rocky overburden to within efficient shovel reach . . . at rock bottom costs.

LETOURNEAU

PEORIA, ILLINOIS • STOCKTON, CALIFORNIA

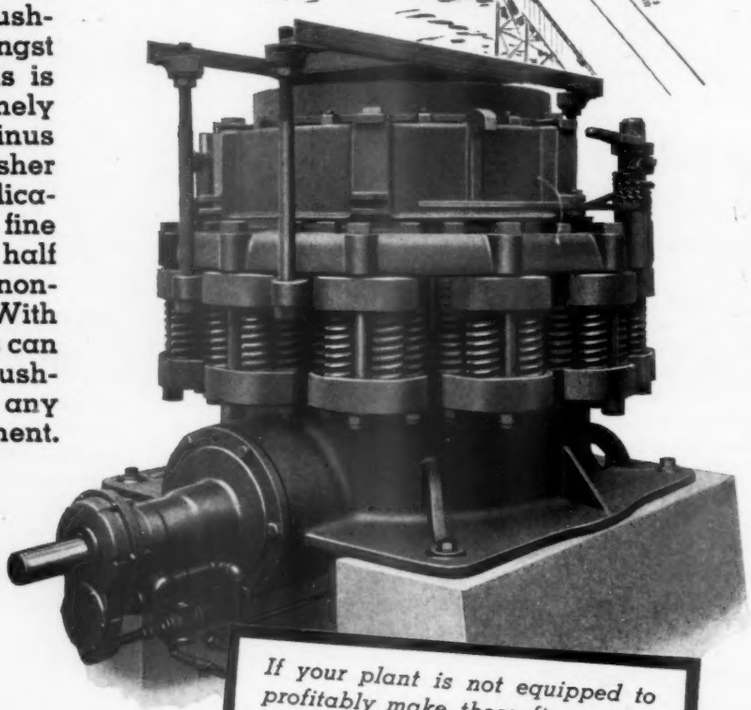
CABLE ADDRESS: "BOBLETORNO"

CARRYALL* SCRAPERS, ANGLEDOZERS*, POWER CONTROL UNITS, BULLDOZERS, ROOTERS*, TRACTOR CRANES, SHEEP'S FOOT ROLLERS, PUSHDOZERS, TOURNAPULLS*, TOURNATRAILERS*, TOURNACRANE.

*Name Reg. U. S. Pat. Off.

Half of all CONES now sold are SYMONS SHORT HEADS

The rapidly increasing number of installations of Symons Cone Crushers of the Short Head Type amongst producers of industrial minerals is evidence of greater use of finely crushed materials, especially minus ½ inch sizes. While this Crusher originally had its greatest application for making the extremely fine sizes required in metal mining, half of the Cones now going into the non-metallic field are Short Heads. With this Crusher, minus ½ inch sizes can be made in quantity at a lower crushing cost than is possible with any other type of crushing equipment. Only those sizes need be made for which there is ready sale. The making of unsalable sizes is avoided. Costly stockpiling, re-handling and re-crushing are eliminated. In many instances, users of Standard cones are now following the original Cone installation with a Short Head, resulting in increased output of finer sizes produced at greater profit.



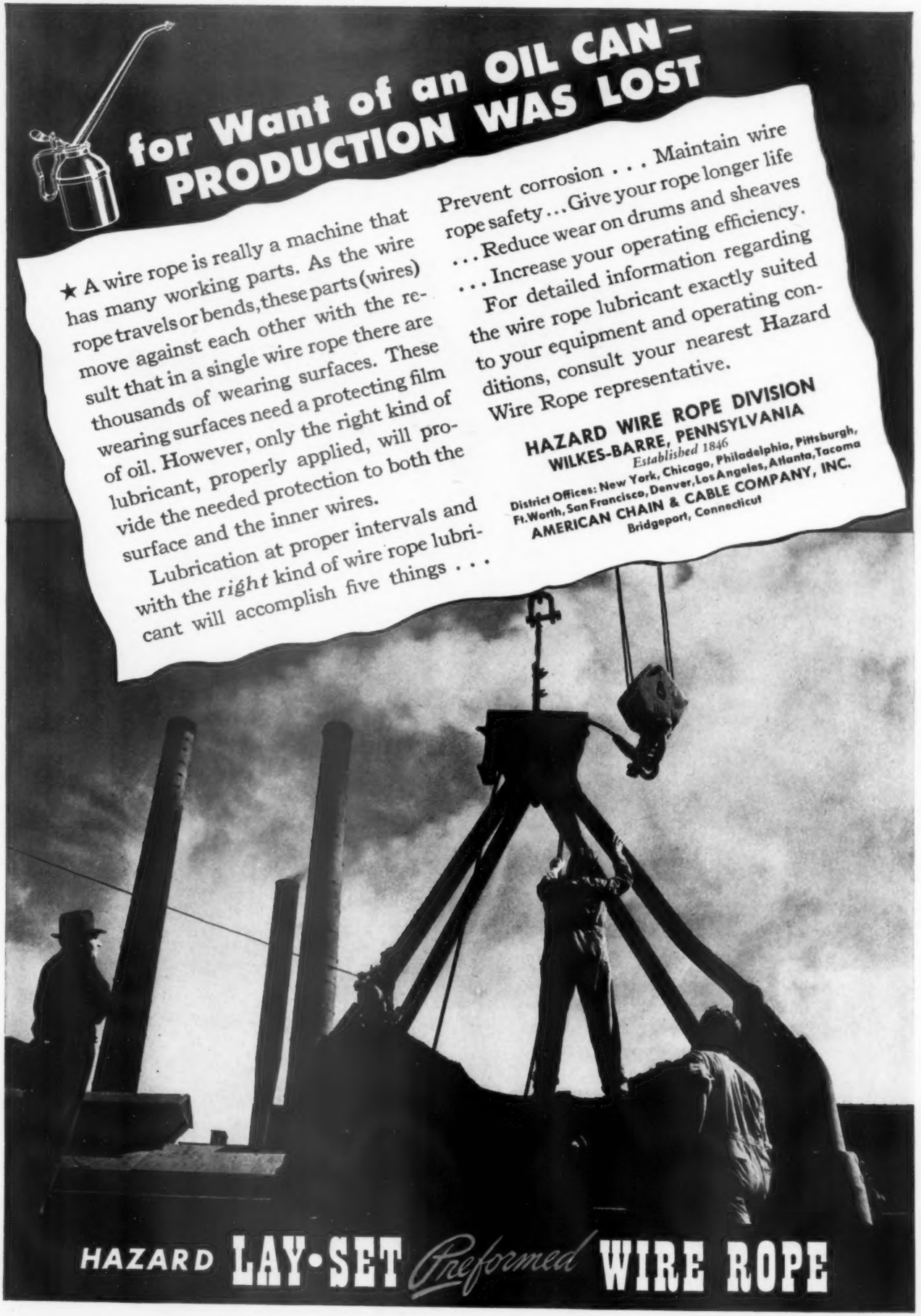
If your plant is not equipped to profitably make these finer sizes, investigate the merits of the Short Head Cone.

NORDBERG MACHINERY

NORDBERG MFG. CO. MILWAUKEE WISCONSIN

NEW YORK • LOS ANGELES • LONDON • TORONTO

SYMONS CONE CRUSHERS


for Want of an OIL CAN—
PRODUCTION WAS LOST
★ A wire rope is really a machine that has many working parts. As the wire rope travels or bends, these parts (wires) move against each other with the result that in a single wire rope there are thousands of wearing surfaces. These wearing surfaces need a protecting film of oil. However, only the right kind of lubricant, properly applied, will provide the needed protection to both the surface and the inner wires.
Lubrication at proper intervals and with the *right* kind of wire rope lubricant will accomplish five things . . .
Prevent corrosion . . . Maintain wire rope safety . . . Give your rope longer life . . . Reduce wear on drums and sheaves . . . Increase your operating efficiency.
For detailed information regarding the wire rope lubricant exactly suited to your equipment and operating conditions, consult your nearest Hazard Wire Rope representative.
HAZARD WIRE ROPE DIVISION
WILKES-BARRE, PENNSYLVANIA
Established 1846
District Offices: New York, Chicago, Philadelphia, Pittsburgh, Ft. Worth, San Francisco, Denver, Los Angeles, Atlanta, Tacoma
AMERICAN CHAIN & CABLE COMPANY, INC.
Bridgeport, Connecticut
HAZARD LAY-SET Preformed WIRE ROPE

war is hell

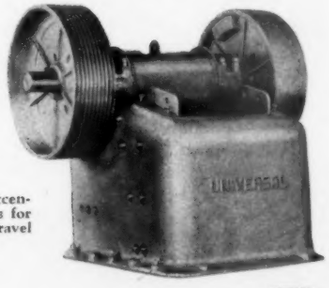
on Roads!

Roads don't have to be in combat zones to get "shell holes"—abusive wear of extra heavy trailer-truck traffic and the movement of army vehicles have to be reckoned with.

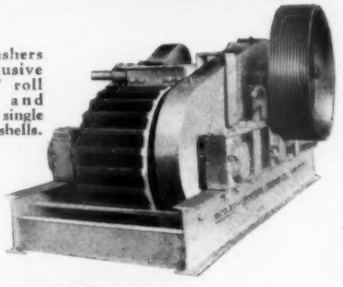
Too, road men have a greater obligation today than ever before, *because the rubber shortage demands the conservation of every tire,* and that means careful maintenance both of arterial highways and feeders.

The tremendous cost of war preparation necessitates economies in normal public works—that's where Universal Crushing Equipment comes in: the greater output it provides minimizes the amount of equipment needed for producing road materials; the weight-saving Rotavator (rotary elevator) Streamlined Crushers developed by Universal engineers reduces wear and tear on roads when portable plants are in transit; and the sound construction, as exemplified by the 6 massive roller bearings on the big quarry crushers, effect savings that road building contractors and commissioners alike cannot afford to overlook.

Let us give you cost and operating facts!



Overhead eccentric crushers for rock and gravel —26 sizes.



Roll Crushers with exclusive "2-in-1" roll shells and standard single diameter shells.

Portable Gravel and Quarry Plants for every requirement.

UNIVERSAL CRUSHER COMPANY

619 C Avenue West — Cedar Rapids, Iowa

UNIVERSAL

CRUSHERS, PULVERIZERS, COMPLETE PLANTS, SPREADEROLLERS, PORTABLE ASPHALT PLANTS

SIZE

is no PROBLEM with WELDED CONSTRUCTION

13-YARD

2-YARD

FOR many years Pettibone Mulliken have been making large size welded dippers for coal stripping. Experience gained in designing and fabricating these larger sizes has enabled Pettibone Mulliken engineers to build smaller dippers from ⅜ to 5 yds.; incorporating in them the same rugged strength quality and the same weight saving features that are responsible for the success of the larger sizes.

Today shovel manufacturers and users are getting greater capacity from their shovels by using PMCO Welded Dippers.

PMCO **WELDED DIPPERS**

THE WEIGHT SAVED IN THE DIPPER GIVES INCREASED CAPACITY TO THE SHOVEL AS HIGH AS 30%

We operate the largest and most complete manganese steel foundry in the United States

PETTIBONE MULLIKEN CORPORATION

Established 1880

4710 West Division Street, Chicago, Illinois

Buckets S-T-R-E-T-C-H

and Last Longer

when you blast more effectively

One way—perhaps the only way today—to increase production is to get more work out of your present equipment. Make it stretch as far as possible, last as long as possible—because you can't count on getting immediate additions or replacements.

Good blasting is one of the most effective "bucket-stretchers" you can find. Use explosives right—use enough—but don't waste them.

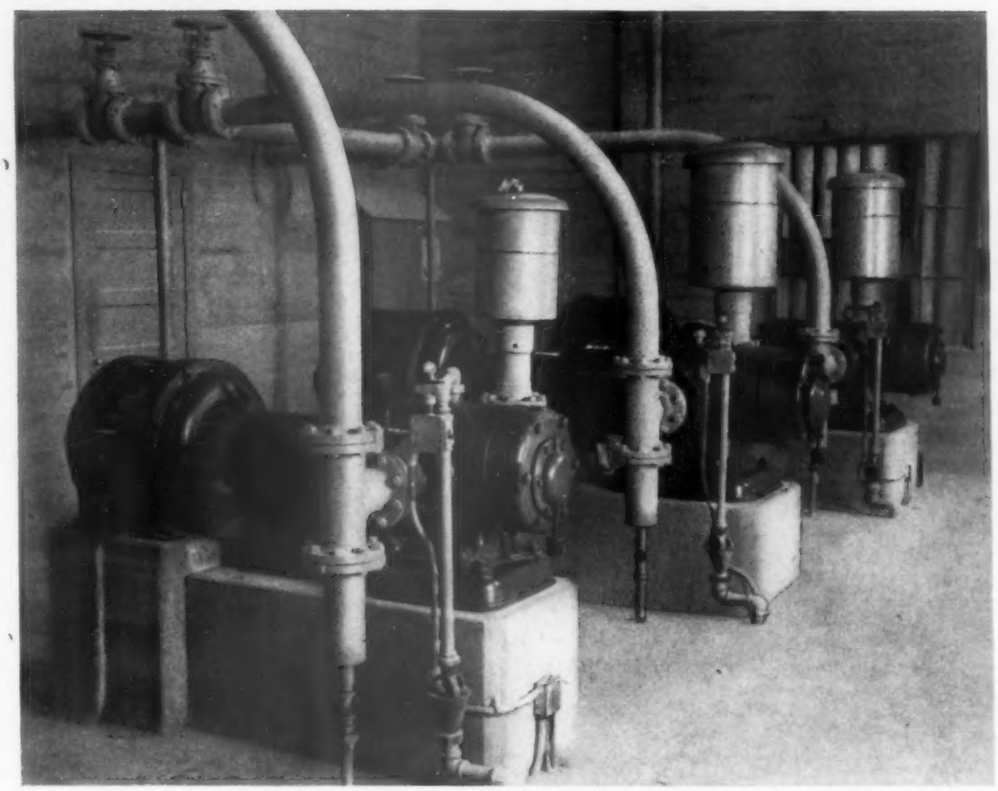
Cooperating with explosives users, Atlas Technical Representatives have been able to help on many types of jobs. Perhaps, by helping with your blasting problems, they can make your equipment go farther.

ATLAS EXPLOSIVES
"Everything for Blasting"

CHEMICALS ATLAS EXPLOSIVES

ATLAS POWDER COMPANY, Wilmington, Del. · Offices in principal cities · Cable Address—Atpowco

A West Coast Cement Company USES 16 FULLER ROTARIES



Just another result of the satisfactory operation of one Fuller Rotary Compressor installed in 1934 by a West Coast cement company. The excellent over-all performance of this initial installation "sold" this company on the adaptability of Fuller Rotaries for cement-plant operation. Result—the installing of 16 units up to the present time. Included in this total are seven machines purchased in 1940, when it was decided to rebuild and modernize this plant, three of which are shown in the above illustration.

As time goes on, more and more cement plant superintendents and engineers are installing Fullers. They're the ideal unit for many uses, viz: slurry agitation . . . fuel, natural gas . . . machine shops . . . quarries . . . Fuller-Kinyon Systems for dry raw materials, cement, flue-dust and pulverized coal.

Send for a copy of our new Bulletin C-5, illustrating and describing these machines.

YOUR COMPRESSORS spot WHERE YOU NEED THE AIR

FULLER COMPANY

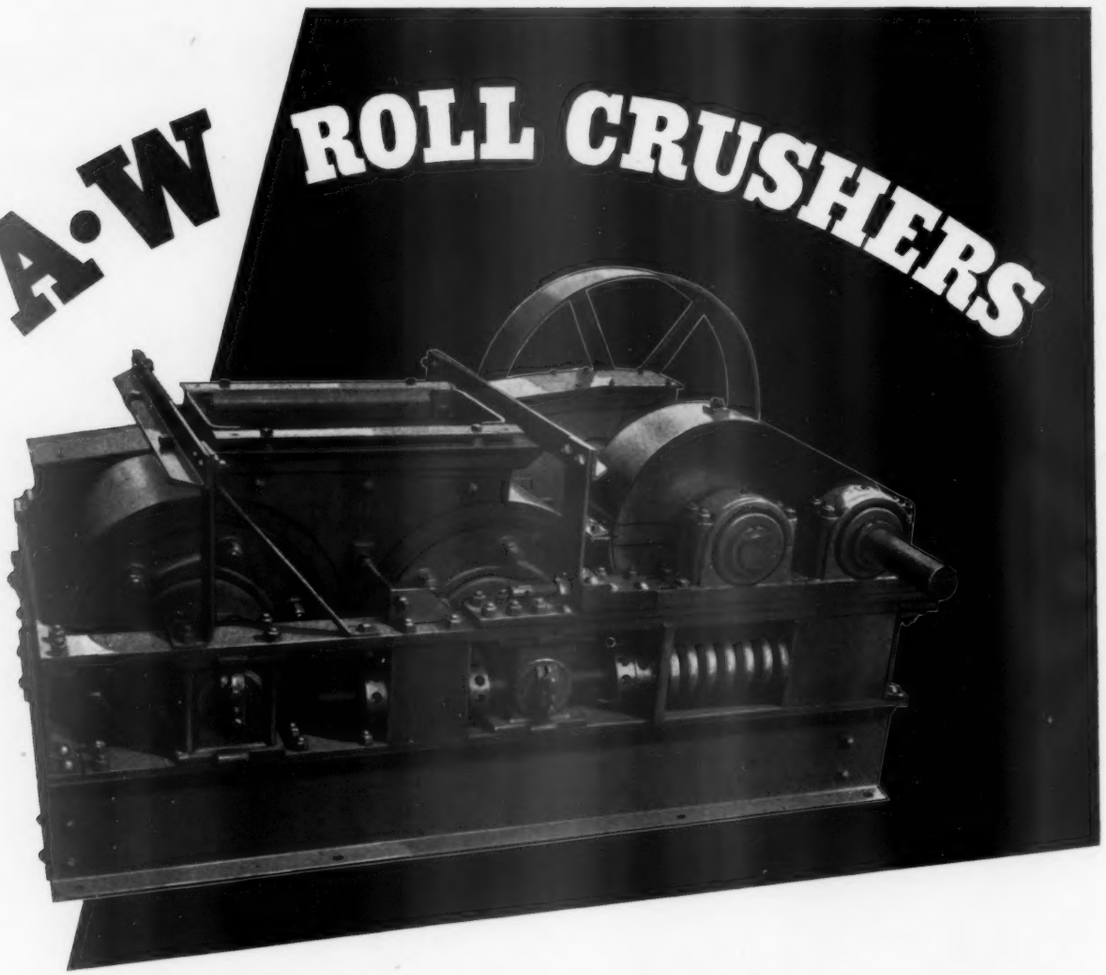
CATASAUQUA, PENNSYLVANIA

Chicago: 1144 Marquette Bldg.
San Francisco: 320-321 Chancery Bldg.

C-67

FULLER-KINYON, FLUXO, AND AIRVEYOR CONVEYING SYSTEMS · · · · ROTARY FEEDERS AND DISCHARGE GATES
ROTARY AIR COMPRESSORS AND VACUUM PUMPS · · · · AIR-QUENCHING COOLERS · · · · BIN SIGNALS

★ A-W ROLL CRUSHERS



Famous for High Continuous Output

● Engineered to operate smoothly and economically at higher speeds, A-W Roll Crushers consistently exceed the top expectations of users . . . by their steady volume production of accurately sized material.

Among the A-W Engineered features responsible for this outstanding record for continuous full load production at record low cost are: (1) Rolls mounted on stationary shafts turn on large SKF self-aligning roller bearings that prevent binding or pinching under any load; (2) Positive chain drive, that is unmatched for reliability; (3) Rolls are fitted with removable shells, assuring big time and cost savings when roller surface must be renewed. Made in 30" x 18" and 40" x 22" sizes. New hydraulic jack mechanism on the 40" x 22" unit, makes spring tension control easy and fast.

The A-W complete line of Crushing and Screening Equipment includes Jaw Crushers in 10" x 16", 10" x 20", 10" x 36", 12" x 20", 15" x 20", 18" x 38", 21" x 38" sizes, conveyors, screens and bins for both fixed and portable plants.

Austin-Western's competent staff of trained men will gladly assist in the economical solution of your rock crushing problems . . . whether they be large or small . . . whether the requirements call for a complete new plant or the addition of equipment to modernize set-ups now in use. THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Ill.

Austin-Western

MOTOR GRADERS
LOADERS
BLADE GRADERS
ELEVATING GRADERS
HYDRAULIC SCRAPERS
CRUSHING AND SCREENING PLANTS
CABLE SCRAPERS
ROLLERS
ROLL-A-PLANES
MOTOR SWEEPERS
BITUMINOUS DISTRIBUTORS
SHOVELS AND CRANES

LESS THAN 1¢ PER TON FOR POWER

IS THE ESTIMATE OF THE OWNERS OF THIS PORTABLE CRUSHING PLANT★ WHEN UNDER CONSISTENT OPERATION

★"Caterpillar" Diesel-powered Cedar Rapids crushing and screening plant on location near Weldon Springs, Mo. —producing crushed rock for large defense powder plant.

AND, of course, the power that can be expected to make such a remarkably low cost possible is "Caterpillar" Diesel.

Here you see two of the three "Caterpillar" Diesel Engines which drive a 25 x 40 crusher and apron feeder, a 20 x 40 heavy-duty roll crusher, and a 9 x 36 jaw crusher, for the Concrete Materials & Construction Co., of Cedar Rapids, Iowa.

With power to spare, these rugged and economical power units put through 175 to 200 tons of crushed rock per hour. And while their running on a 21-hour-per-day crushing schedule is a severe test, the engines are proving the stamina and dependability which have been built into them by the largest manufacturer of Diesel engines in the world.

• • •

"Caterpillar" Diesel Engines have many outstanding features which make them ideal for crusher work.

- ***"Hi-Electro" hardening*** gives crankshaft journals and cylinder liners exceptional wear-resistance.
- ***Dual cooling*** (through both oil and water) means longer life, and lower maintenance for bearings, pistons, rings and liners.
- ***Protective seals*** guard internal moving parts at every point where harmful grit and dirt might enter. These include heavy-duty oil-bath air cleaners; absorbent type fuel filter; combination absorbent and metal-edge type oil filters; completely enclosed valve-operating mechanism and flyball governor; metal-screened crankcase breather.
- ***Super-efficient fuel system*** that requires no adjustment whatever and burns, *completely and cleanly*, even such extra-cheap fuel as No. 3 domestic burner oil.

"Caterpillar" Diesel power has been factory-engineered to leading makes of crushers and other engine-driven equipment. When ordering factory-powered equipment, specify "Caterpillar" Diesel.

CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

• • •

☆ **FOR VICTORY** — *Our armed forces have first call on "Caterpillar" production. We thank customers who have suffered delivery delays by giving clear right-of-way to our Victory efforts.*

CATERPILLAR REG. U.S. PAT. OFF. **DIESEL**

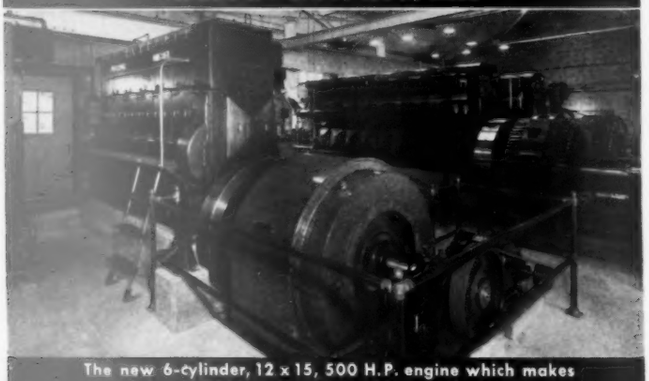
ENGINES AND ELECTRIC SETS

TRACK-TYPE TRACTORS • ROAD MACHINERY

3080 *Superior* HORSEPOWER

Prairie du Rocher pit of the Columbia Quarry Co.

8-cylinder, 12 x 15 Superior Diesel provides 675 H.P. for work at Prairie du Rocher, Illinois.



The new 6-cylinder, 12 x 15, 500 H.P. engine which makes a total of 1425 H.P. at Columbia, Illinois, plant.

..now at work for the Columbia Quarry Company of St. Louis. In 1936 two units of 925 H.P. were installed; in 1937 another unit of 560 H.P. was added, followed in 1938 by one of 420 H.P., and installation of 1175 H.P. in two new units has just been completed. To the best of our knowledge, this total of 3080 H.P. is the largest installed Diesel Horsepower in the rock crushing industry in America.

The repeat orders in the building up of this great power output are justified by only one reason: Superiors have given Columbia Quarry larger earnings and INCREASED PROFITS.

They can do the same for you. May we show you how?

THE NATIONAL SUPPLY COMPANY... SUPERIOR ENGINE DIVISION

SALES OFFICES: Springfield, Ohio; Philadelphia, Penna.; New York, N. Y.; Los Angeles, Cal.; Jacksonville, Fla.; Houston, Texas; St. Louis, Mo.; Fort Worth, Texas; Tulsa, Okla.; Boston, Mass. FACTORIES: Springfield, Ohio; Philadelphia, Penna.

170,000 Tons in 4½ Months

TELSMITH PLANT

speeds construction of Army Ordnance Works

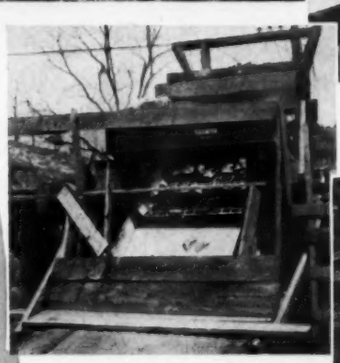
★ For the new powder bag-loading plant at the New River Ordnance Works near Radford, Va. 300,000 tons or more crushed aggregate will be required. To supply it the Pendleton Construction Corp. of Wytheville, Va. with the co-operation of Telsmith engineers built a new crushing plant near Dublin, Va. It is Telsmith equipped *throughout!*

Actual crushing began March 13, 1941, and by the end of July, 170,000 tons of aggregate had been turned out. The capacity naturally varies—from 150 tons to 100 tons per hour—depending upon the sizes produced. Six different sizes of finished products can be made.

The plant amply demonstrates *Telsmith planned production.* Properly co-ordinated and balanced, all units are working smoothly —giving flexibility as to sizes, and dependability as to quantity and quality of product. That's as typically Telsmith as the low cost per ton.

Each of the three Telsmith Crushers (Jaw, Gyrasphere, Roll) is driven by its own Diesel. A Diesel-electric generator supplies current for the individual electric motor drives on the Telsmith Apron Feeder, the two Telsmith screens and the four Telsmith-Barber-Greene Steel Frame Belt Conveyors.

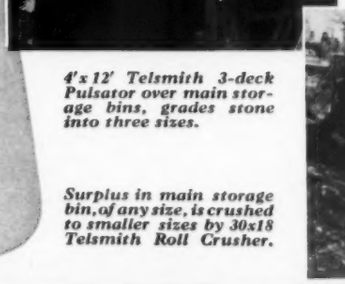
For details on Planned Plant Production by Telsmith—*get Bulletin Q-15.*



Under hopper, 36" x 12' Telsmith Heavy Duty Apron Feeder delivers to 24x36 Telsmith Roller Bearing Jaw Crusher.

Telsmith 4'x12' two-deck Pulsator over small loading bin. Rejects from the top deck are recrushed by the Gyrasphere.

No. 48 Telsmith Gyrasphere, in closed circuit with 3-deck screen, recrushes the top deck rejects.



4'x12' Telsmith 3-deck Pulsator over main storage bins, grades stone into three sizes.

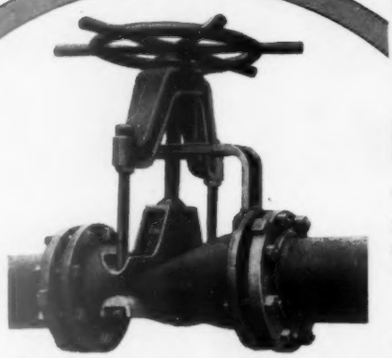
Surplus in main storage bin, of any size, is crushed to smaller sizes by 30x18 Telsmith Roll Crusher.

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE, WISCONSIN

Cable Addresses: Sengworks, Milwaukee—Concrete, London

Room 1604—50 East 42nd St. New York City
211 W. Wacker Drive Chicago, Ill.
713 Commercial Trust Bldg. Philadelphia, Pa.
19-21 Charles St. Cambridge, Mass.
Borchert-Ingersoll, Inc. St. Paul, Minnesota
Brandeis M. & S. Co. Louisville, Ky.
Charleston Tractor & Eqpt. Corp. Charleston, W. Va.
Roanoke Trac. & Eqpt. Co. Roanoke, Va.
North Carolina Eqpt. Co. Raleigh and Stateville, N. C.
Wilson-Weesner-Wilkinson Co. Knoxville and Nashville, Tenn.
G. F. Seeley & Co. Toronto, Ont.

For ABRASIVE or CORROSIVE
PULPS and LIQUIDS
MASSCO-GRIGSBY PINCH VALVES



These valves can be used in locations exposed to freezing weather, whereas frost causes trouble with metal valves.

● With certain modifications Massco-Grigsby Valves are acid-resistant and can be used on oily liquids.

SIZES: *1", 2", 3", 4", 6", 8" and 10", inside diameter*

Wherever abrasive or corrosive liquids must be moved, these valves are finding wider and wider use. They are needed in ore milling, cement plants, dredging and many industrial operations where severe wear makes frequent replacement of metal type valves too expensive.

The body of the Massco-Grigsby Pinch Valve is made of special molded rubber reinforced with fabric. In the 1", 2" and 3" sizes this sleeve withstands pressures up to 100 lbs. per square inch; up to 150 lbs. per square inch in the larger sizes. Due to special patented design, the sleeve does not crack or wear under frequent valve adjustments.

There is no wear on moving parts and no working parts contact the liquid or pulp. There are no packing glands. Resistance to wear is substantially greater than on the metallic interior parts of gate or plug valves. The sleeve wears evenly; complete shut-off even on coarse particles because the rubber compresses around the particles.

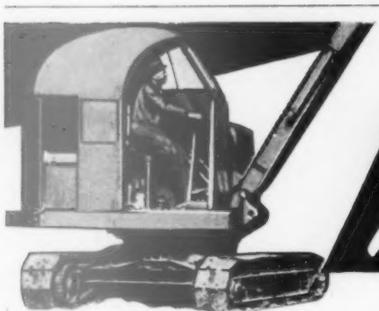
Write for New Descriptive Folder

Crushers; Marcy Ball, Rod and Tube Mills; Wilfley Tables; Density Controllers—Laboratory Equipment and Chemicals—Mine and Mill Supplies.

DENVER
SALT LAKE CITY
EL PASO
SAN FRANCISCO
NEW YORK CITY

The Mine & Smelter Supply Co.

CANADIAN VICKERS, LTD. *Montreal*
EDW. J. NELL CO. *Manila, P. I.*
W. R. JUDSON *Santiago, Lima*



WELDED
ROLLED STEEL CONSTRUCTION for GREATER STRENGTH and SPEED
BULLDOG GRIP

● There is tremendous closing power in Williams Buckets. That's why they bite so deeply and cleanly in hardpan digging, or work so proficiently in clearing rubble, lifting rocks or slabs of concrete.

Williams Buckets are "built to last and move dirt fast". All-welded construction at vital points imparts greater strength while eliminating excess weight; only riveted at sections which may ultimately require replacement. Another important exclusive feature of the Williams bucket, illustrated in action, is straight line reeving that reduces wear and prolongs cable life.

Many definite reasons why your next bucket should be a Williams are found in the individual bulletins completely describing each type of Williams Bucket. Sent free on request.

THE WELLMAN ENGINEERING CO. • 7014 Central Ave., Cleveland, Ohio

Distributors in all parts of the country

WILLIAMS *Buckets*
built by WELLMAN

Because frequent bending is necessary for this class of service, wire ropes for erection derricks should be free from liveliness and twisting tendencies. They should also have maximum fatigue-resisting properties. Tiger Brand Excellay Preformed meets all these requirements satisfactorily and economically.

In scraper wagons, bull dozers, graders and similar equipment, drums are unusually small, and overwinding cannot be avoided. Tiger Brand Excellay Preformed offers just the right combination of characteristics to resist the abuse, bending and abrasive conditions of such service.

On shovels, wire rope is required to bend repeatedly over drums and sheaves and is subjected to shock loads, vibration and external wear. Tiger Brand Excellay Preformed Wire Rope, because of its strength and superior fatigue-resisting properties, will improve service on this class of equipment.

Connecting American Tiger Brand Locked Coil Track Cable to cableway tower at Shasta Dam. Photo by courtesy U. S. Department of the Interior.

INDISPENSABLE TO AMERICA'S WAR EFFORT . . .

Good Wire Rope

Take care of what you have... use it properly... make it last longer

JUST check over in your mind the important equipment that requires wire rope for its operation — cableways, tramways, shovels, draglines, cranes, derricks, scrapers, to mention a few. Then think of the vital part such equipment is playing right now in the building of new plants, airports, army camps, roads and other vital war-time facilities.

Do you wonder that we say that *good* wire rope is indispensable for the success of our war program.

In American Tiger Brand Wire Rope we offer you the quality of rope you *must* have if you expect to meet the demands of war-time operation.

To help you get the most out of Tiger Brand Wire Rope we are prepared to help you select the right type of rope that will best suit your equipment and will gladly show you how to make it last under hard, continuous duty. Remember — every wire rope allowed to wear out prematurely is an unnecessary loss to the nation.

AMERICAN STEEL & WIRE COMPANY
Cleveland, Chicago and New York
COLUMBIA STEEL COMPANY
San Francisco
United States Steel Export Company, New York

Excellay Preformed

UNITED STATES STEEL

Engineered to help you get—
TONNAGE and lower costs
FOR HEAVY-LIGHT-EXTREME or NORMAL SERVICE

Specify and use QUAKER

This defense emergency demands a continuous flow of materials . . . no stoppage or loss of time—You'll find Quaker Conveyor Belting able to meet it.

Quaker's Transmission and Conveyor Belting has that outstanding quality to take punishment under conditions—sometimes far from ideal, yet giving extra long service. Because Quaker's Belts are specifically made to fit conditions and operation needs.

Through war or peace, Quaker is constantly making laboratory and field tests. Care is exercised in selection of all raw materials. Fine workmanship and expert supervision assure you of quality and extra performance in the finished product . . . Call on Quaker's Engineers to serve you on your Belting problems. Time is precious, NOW.

DO NOT HESITATE TO CALL ON US FOR INFORMATION, SERVICE OR HELP

QUAKER RUBBER CORPORATION

OVER 55 YEARS CONSISTENT QUALITY

PHILADELPHIA

NEW YORK • BUFFALO • CHICAGO • MEMPHIS • HOUSTON • SAN FRANCISCO

Clipper Shovel Operators Lead the Life of Reilly!

Buckeye Trench Hoe speeds excavations, roughing out sewers and big trench at 4th Armored Division's Pine Camp — facilities for 15,000 men, project covers 16,000 acres, near Watertown, N.Y.

yet average more yards on every shift

The Buckeye Clipper's Mevac (metered vacuum) Power Control makes shovel operating a "white collar" job. Six "palm fitting" handles — grouped with those used most in easiest reach — do the job smoothly and quickly, guiding the shovel through its work cycle. And yet the "feel" is as sensitive as on old steam rigs.

Upholstered operator's seat, arm rest, 215° clear view — *no wonder operators deliver plus yardage right up to the end of the shift.*

Vacuum Power Control saves for you, too, Boss — ask the maintenance men of those that own them. No leaky pressure lines, no mechanical jamming and jerking, longer clutch lining life, longer rope wear, all-season operation — there's nothing to condense or freeze in the Mevac System, no linkage troubles. And vacuum control is *only one of 24 preference points!*

The Clipper is tomorrow's shovel today. They're cutting costs *everywhere* for contractors, pits, quarries, material yards and municipalities. Three models

The "50"	The "60"	The "70"
½ yd.	⅝ yd.	¾ yd.

Quickly convertible to crane, dragline, trench hoe, pile driver — gasoline or diesel powered.

BUCKEYE TRACTION DITCHER CO.
FINDLAY, OHIO

Built by Buckeye

Convertible Shovels

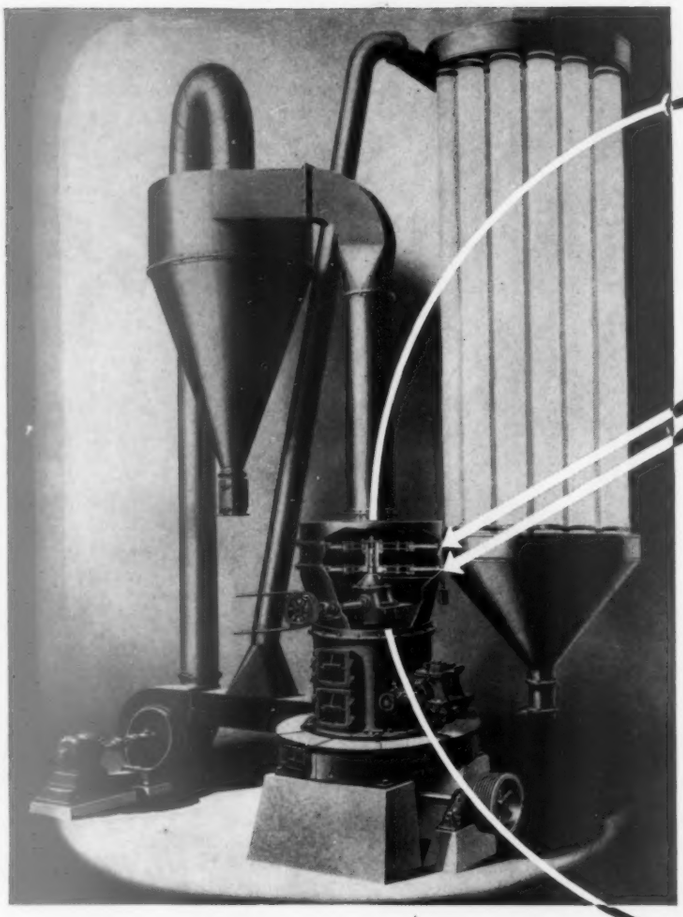
Trenchers

Tractor Equipment

R-B Finegraders

Road Wideners

Spreaders



RAYMOND DOUBLE WHIZZER ROLLER MILL

TYPICAL OPERATIONS

- Drying and grinding limestone screenings
- Pulverizing sulphur with CO_2 gas in the system
- Grinding clay and removing impurities, mica or sand
- Pulverizing resins and cooling the material in process

Are You making SUPERFINE MATERIALS?

or... other powdered products within a fineness range of 60% passing 100-mesh to 99.9% minus 325-mesh or finer. Then you can use the Raymond Roller Mill with the double whizzer separator, and profit by the following advantages:

1. Instant fineness control by varying the speed of the revolving whizzer while the machine is running. 2. Constant uniformity of particle size at any degree of classification. 3. Removal of surface moisture from material while pulverizing. 4. Rejection of impurities by automatic throw-out attachment.

For grinding non-metallic minerals such as limestone, gypsum, clays, chalk whiting, bauxite, barytes, phosphate rock, various fillers and similar materials, you can avail yourself of lower costs and better products with the Raymond Roller Mill.

SINCE 1887

For further details, Refer to Catalog No. 51

RAYMOND PULVERIZER DIVISION
COMBUSTION ENGINEERING COMPANY, INC.
1321 North Branch Street **CHICAGO**
Sales Offices in Principal Cities • • • In Canada: Combustion Engineering Corporation, Ltd., Montreal

©CIB 537057 CR
MAR 2 6 1942

PIT AND QUARRY

Vol. 34 MARCH, 1942 No. 9

CONTENTS

News of the Industry 39
The Victory Program . . . and Your Business 44
Editorial: Enemy Voices Within 49
Sand, Gravel, Ready-Mix Operators Seek Solution at 1942 Conventions to Problems Raised by War 50
Dewatering Station Reclaims High Percentage of Sand at New Western Indiana Gravel Plant 63
American Aggregates Rebuilds Plant 13A in Oxford District 65
Crushers Arranged Flexibly So Plant Can Keep Up with Quarry Changes . . 68
A Planned Power-Transmission System . . 70
Operating Views as Caught by the Camera 72
N.C.S.A. Marks 25 Years of Service to Industry as Silver-Anniversary Convention in Cincinnati 73
Operating Problems, Priority Rulings Discussed by Ready-Mixed Operators . . . 103
Unitized Batching Speeds Production of Concrete for Big Ordnance Plant . . . 109

Personal Mention 86
Traffic News Digest 87
Labor Decisions 90
Occupational Diseases and the Law 94
New Machinery and Supplies 97

Published on the first of each month for producers and manufacturers of Cement, Crushed Stone, Gypsum, Lime, Sand, Gravel and other nonmetallic minerals. Copyrighted 1942 by Complete Service Publishing Co., 538 South Clark Street, Chicago, Ill.

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Associate Editor:
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 8558
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 1235, 101 Park Ave.
Telephone CAledonia 5-4438
New York, N. Y.

Central Advertising Manager:
D. R. EGBERT
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

Advertising Representatives:
A. C. PETERSEN
Chicago, Ill.

W. H. GRUBBS
Western Pacific Bldg.
Telephone Prospect 3746
Los Angeles, Cal.

ROBERT W. WALKER
68 Post Street
Telephone Sutter 6706
San Francisco, Cal.

Field Representatives:
J. K. GARESCHE
H. C. FINLEY

MEMBER AUDIT BUREAU OF CIRCULATIONS

"X-Ray" Booklet Shows New Features of Improved Robins-Gyrex Screen;

Reader Builds Typical GYREX in Unique Catalog

Construction, Design Details Highlighted

Send for Free Copy, Using Coupon Below

PASSAIC, N. J.—Robins Conveying Belt Company, this city, has just released for free distribution a handsome "X-ray" type booklet which describes in an interesting and complete manner recent improvements and general information regarding the well-known ROBINS-GYREX Vibrating Screen. The new catalog (Robins Bulletin No. 115) is replete with unusual effects, all of which are successful in making plain to the reader the scientific design and rugged construction of GYREX Screens.

X-Ray Feature

In the first few pages of the new Bulletin, the various important parts of the GYREX Screen are printed on separate transparent sheets. Together these pages make up a complete screen, but taken separately they permit the reader to study each element of construction or design independently of the rest.

Installation Pictures

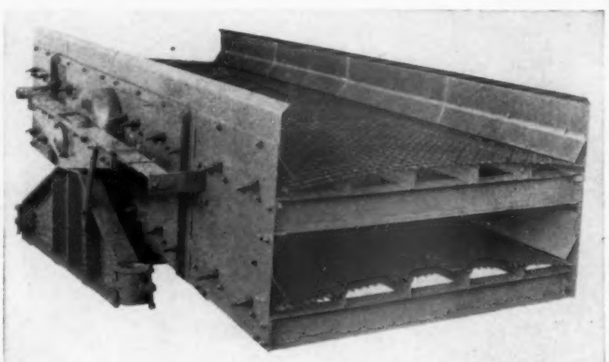
In the center of the new GYREX Bulletin is a colorful three-page spread which testifies to the versatility of GYREX Screens. In all, thirteen actual installations are reproduced, including Sand, Gravel, Coal, Coke, Limestone, Pebble Phosphate, Rip-rap and many other applications.

Complete Layout Dimensions

Complete dimensions with drawings for layout purposes are furnished in Bulletin No. 115, for both Cast Base and Steel Base GYREX Screens. Use the convenient coupon below and request your copy of the "X-Ray" Bulletin today.

DON'T WASTE MATERIALS. If you have not a bona-fide interest in these bulletins—please do not send for them.

Rugged, Vibrating Screen, Built for Hard Service



Robins-Gyrex, product of Robins Conveying Belt Company

Robins-Built Screen Line Is Complete

6 Different Types Cover Entire Screening Range

PASSAIC, N. J.—In addition to the GYREX, Robins Conveying Belt Company manufactures the VIBREX, a high speed, unbalanced vibrator for fine sizing. Bulletin No. 118 describes this popular unit.

The ROBINS-ELIPTEX Screen is ideal for horizontal installations where headroom is limited, or for dewatering service. Bulletin No. 111.

ROBINS-LIQUID Screens for clarifying liquids or dewatering solids are used in dozens of highly diversified applications in the process industries. Bulletin No. 107.

The ROBINS-CONTRACTOR'S Screen is a small, portable, general purpose unit. Bulletin No. 110.

ROBINS FOUNDRY SHAKEOUT Screens are made for both continuous or pick-up operation.

9 Reasons for GYREX Popularity

These Features Fully Described in X-Ray Bulletin

PASSAIC, N. J.—The following are reasons why so many hundreds of operators choose GYREX Screens;

1. Simplicity of design, the result of experienced engineering—means RELIABLE PERFORMANCE.

2. Super-sealed bearings and heavy duty structure—for LOWER MAINTENANCE.

3. Central vibrator location and balanced stabilizing springs, insuring uniform, positive motion—a guarantee of HIGH CAPACITY and EFFICIENCY.

4. Minimum number of easily accessible cloth attachment bolts and ability to flatten live frame to clear chutes—providing SPEEDY CLOTH CHANGE.

5. Positive eccentric shaft and massive anvil-type base frame—which means ABILITY TO STAND UP TO OVERLOADS.

6. Easy access to mechanical parts and guaranteed interchangeability of replacements—make GYREX EASY TO SERVICE.

7. Spring tensioned cloth supported on rubber cushioned arched frame prevents whipping and crystallization — providing LONG CLOTH LIFE.

8. Screw adjusted counterbalance weights—which mean PERFECT BALANCE WITH NO ESCAPING VIBRATION.

9. The wide range of sizes and styles available enables Robins engineers, guided by their broad background of experience, to make the most suitable recommendations—making certain of PROPER APPLICATION.

Gyrex Famous in Many Fields

Versatile Screen Is Positive Stroke Circle-Throw Type

PASSAIC, N. J.—Unsurpassed in versatility of application and in stamina, ROBINS-GYREX Screens are built in a complete range of sizes from 24″ x 54″ to 72″ x 192″. The latter are the largest and heaviest vibrating screens in the world. (See picture below). Standard units are available with one, two or three decks; with heavy, cast base and angle adjustment for floor mounting or with steel base for suspended or rigid mounting.

Quick-Change Attachment

This special feature available on GYREX Screens cuts the time required for cloth changes to an absolute minimum. It is a particular boon to operators who must change cloth frequently to produce products of varying specifications.

Robins Screen Cloth

New Robins Bulletin No. 113 is a fact-full illustrated story of the complete selection of Robins Woven Wire Cloth for Vibrating Screens. The bulletin contains helpful data on cloth specifications, wire diameter, comparison of round with square openings, etc. Pictures of various Robins weaves and cloth-holding methods are also shown. Copies of Bulletin No. 113 are available without charge.

World's Largest Screen

This picture was taken at Robins Passaic, N. J. works. The Screen is a ROBINS-GYREX 72″ x 192″.

Please send a copy of your new "X-RAY" Bulletin to—

Name_____

Address_____

ROBINS CONVEYING BELT COMPANY
Passaic, N. J.

PIT AND QUARRY

CHICAGO

March, 1942

Building Contracts Awarded Show Drop from 1941 Average

Building and engineering contracts awarded in the 37 eastern states during the month of January amounted to $316,846,000, according to F. W. Dodge Corporation. This represented a moderate increase over the $305,204,000 recorded for January of last year. In dollar volume, non-residential building was up 4 per cent. from the corresponding month of 1941, residential building was down 8 per cent., and public works and utilities construction (heavy engineering) was up 21 per cent.

While new residential building, exclusive of hotel, barracks and dormitory projects, decreased 17 per cent. in dollar volume from January of last year, the decline in number of new family dwelling units contracted for was less than 2 per cent., a lower average contract price per unit, reflecting the shift of the residential building program to low-cost defense housing units.

Commenting on the January construction record, Thomas S. Holden, president of F. W. Dodge Corporation, stated: "While the contract volume for the month showed a slight increase over January of last year, it fell considerably behind the $500,000,000 average monthly volume for 1941, and also measurably behind the December, 1941, figures. Apparently this is entirely due to the fact that this year's big war construction program has as yet been only partially scheduled by the War Production Board. It is generally anticipated that this year's total construction volume will approximate that of 1941, the post-depression record year."

New England Lime to Produce Magnesium

The New England Lime Company of Adams, Massachusetts, which is to construct a plant in Adams or at Canaan, Connecticut, capable of producing annually 7,500,000 pounds of magnesium used in manufacture of incendiary bombs and airplane motors, has been allowed to qualify for sale in Massachusetts $576,800 of debentures due in 1966.

Quarry Firm Loses Water-Damage Case

Holding there was no evidence that water which in 1938 damaged the quarry of the Ryan Stone Company, Inc., in Albion, New York came from the Barge Canal, Court of Claims Judge Marvin R. Dye has dismissed the company's claim for $12,883 against the state.

The Ryan firm had also filed a claim for $50,490 over similar damage done in 1940. Only the first claim was tried. Dismissal of the 1940 claim will be sought at the next term of court.

Coming Events

March 2-6, 1942 — Memphis. Annual convention, American Road Builders Association.

March 10, 1942 — Syracuse, New York. Annual meeting, New York State Crushed Stone Association, Hotel Syracuse.

April 18-24, 1942—Cleveland. First Western Hemisphere Foundry Congress, Cleveland Auditorium.

May 26-28, 1942—Hot Springs, Virginia. Annual convention, National Lime Association, The Homestead.

June 9-11, 1942 — Cleveland. Annual convention, National Concrete Burial Vault Association, Hotel Cleveland.

June 22-26, 1942 — Atlantic City. Annual convention, American Society for Testing Materials.

Quarry Operators in Market for Large Amount of Equipment

The crushed-stone industry will purchase more than $7,500,000 worth of new machinery in 1942.

The basis for this prediction is gleaned from figures obtained in January by the National Crushed Stone Association in a questionnaire-survey undertaken primarily to find out what the critical-materials requirements will be for that industry this year. The survey was made following a request for the information by Dr. Wilbur A. Nelson, Administrator of Mine Priorities.

Eleven typical crushed-stone producers whose production in 1941 totalled 10,855,000 tons reported that they spent $420,170 for complete new machines last year, exclusive of parts for replacement. In other words, approximately 3.9 cents was spent for new equipment for each ton of material produced. The association estimates that the 1942 production of crushed stone will reach 195,000,000 tons. Assuming that the figure 3.9 cents will hold good again this year, purchase requirements should total $7,605,000.

Indiana Aggregates Firm Adds Equipment

Due to an increase in business the Myers Sand & Gravel Company of Anderson, Indiana, is installing over $30,000 worth of new equipment at its plant north of the city. The company is developing a new deposit along Killbuck Creek. Several abandoned interurban cars were purchased and converted into storerooms.

Oregon Producer Puts Plant in Operation

The Albany Sand & Gravel Company has just finished building a $25,000 plant on the Paul Duncan Ranch one mile northeast of Sweet Home, Oregon. Twelve men are now employed.

Improvements Make Atoyac's Plant One of Mexico's Finest

Cementos Atoyac, S.A., (formerly, Compañia de Cemento Portland "Landa," S.A.) one of the oldest established cement concerns in Mexico, as well as one of the first on the North American continent to break away from its established business of manufacturing Portland cement to manufacture special and masonry cements, recently changed ownership. Mexico City banking interests headed by the firm, J. Lacaud y Cia., acquired the plant and properties. It is recalled that during 1941 a new cement company was organized in Mexico, to build a cement plant at Guadalajara, Jalisco, and that the firm, J. Lacaud y Cia., headed the banking group financing this development. The Guadalajara company is the only new cement company to be formed in Mexico during the past ten years, and it is being constructed especially to manufacture special and masonry cements, under license from the Cement Process Corporation, in which the Blank Process will be used to produce three special cement products similar to the three special cements "Atoyac," "Plastocement" and "Caloyac" which have been produced by the Atoyac Cement company since 1933.

Cementos Atoyac, S.A., organized and placed into operation its plant at Puebla, State of Puebla, Mexico, in the year 1920, and until the year 1933 produced Portland cement. Since 1933 special cements have been produced in its plant and the manufacture of Portland cement was discontinued a number of years ago. The initial Atoyac plant consisted of a 6- by 70-foot rotary kiln, followed a number of years later by the addition of a second kiln 6- by 133-foot. During 1929 a major construction program was initiated and an 8- by 75-foot kiln, an 8- by 133-foot dryer and an 8- by 40-foot cooler was installed together with additional crushing, preliminary and fine grinding mills in raw and cement grinding departments.

Improvements to the Atoyac plant made recently consist of the installation of a No. 6 Williams Jumbo hammermill for the crushing of the limestone and shale. The two gyratory crushers previously in use will be kept as spare units. Traylor rolls were installed for the preliminary reduction of clinker, and the two Sturtevant mills formerly doing this work remain as spare units.

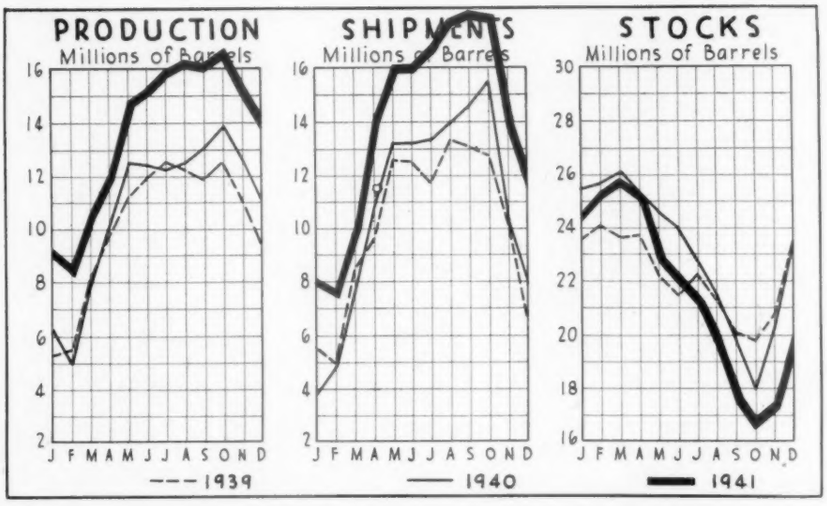
Present improvements planned by the new owners consist in modernizing the quarries which are at present operated entirely by hand labor. Additional storage silos will be built, grinding equipment is to be added, and an 8- by 100-foot kiln recently purchased will be lengthened to 133 feet and installed in the main plant. The old 7- by 70-foot kiln will be removed from its present location into the main plant and be enlarged to 133 feet. New office buildings for the staff are also in prospect. The small "Indio" plant which is removed from the main plant will continue to produce the masonry cement "Caloyac" as a separate unit.

The Atoyac company will continue the manufacture of the special cements under the Blank Process, having obtained the exclusive rights for the state of Puebla from the Cement Process Corporation. Alton J. Blank, for many years associated with the Atoyac company, continues as its general manager.

★ ★ ★ ★ ★

For the freedom of humanity. . . .
Buy a Defense Bond

★ ★ ★ ★ ★

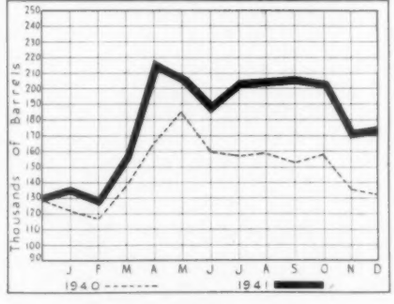


The Portland-cement industry in December, 1941, produced 13,810,000 barrels, shipped 11,511,000 barrels from the mills, and had in stock at the end of the month 19,937,000 barrels of cement, according to the Bureau of Mines. Production and shipments in December, 1941, showed increases of 23.4 and 4.1 per cent., respectively, as compared with December, 1940. Portland-cement stocks at mills were 14.7 per cent. lower than a year ago. The preliminary totals of production and shipments for 1941 show increases, respectively, of 25.9 and 28.5 per cent. from the final totals for 1940 (See table below).

PRODUCTION, SHIPMENTS, AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1940 AND 1941

Month	Production		Shipments		Stocks at end of month	
	1940	1941	1940	1941	1940	1941
January	6,205,000	9,021,000	3,893,000	7,984,000	25,759,000	24,416,000
February	5,041,000	8,345,000	4,907,000	7,456,000	25,894,000	25,307,000
March	7,918,000	10,596,000	7,716,000	9,915,000	26,118,000	25,988,000
April	10,043,000	12,196,000	10,829,000	14,132,000	25,348,000	24,056,000
May	12,633,000	14,732,000	13,206,000	16,048,000	24,758,000	22,745,000
June	12,490,000	15,223,000	13,223,000	16,109,000	24,010,000	21,865,000
July	12,290,000	16,000,000	13,442,000	16,687,000	22,855,000	21,178,000
August	12,712,000	16,345,000	14,018,000	17,825,000	21,549,000	19,732,000
September	13,105,000	16,115,000	14,741,000	18,284,000	19,921,000	17,561,000
October	13,935,000	16,688,000	15,776,000	17,833,000	18,008,000	16,417,000
November	12,725,000	14,931,000	10,372,000	13,724,000	20,353,000	17,638,000
December	11,195,000	13,810,000	8,192,000	11,511,000	23,379,000	19,937,000
	130,292,000	164,002,000	130,315,000	167,508,000	.....	.....

MONTHLY LIME SHIPMENTS, 1940 - 1941 AS REPORTED TO NATIONAL LIME ASS'N.



According to data collected by the National Lime Association, 71 companies in December, 1941, shipped 173,857 tons of lime (124,719 quicklime; 49,138 hydrate). Reporting companies represent 47.4 per cent. of the association's total capacity of record. Based on PIT AND QUARRY'S estimate for the remainder of the industry, the total shipments for the month by all plants were approximately 440,000 tons. Shipments of lime by uses for December, 1941, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	558	2,954
Building	13,910	21,264
Chemical	110,251	24,920
Total	124,719	49,138

Former Road Chief to Direct Activities for Utah Producer

Appointment of Ezra C. Knowlton as executive vice-president of the Utah Sand & Gravel Company, of Salt Lake City, has been announced by Eric W. Ryberg, president.

For 25 years ending last June, Mr. Knowlton was an engineer for the Utah road commission and for the last four years was chief engineer. He resigned from the latter position to become office manager in charge of the engineering section for the constructing quartermaster for Ogden and vicinity.

Mr. Ryberg was president and general manager of the Utah Sand & Gravel Company until recently when he retired from active management but retained the presidency. LeRoy Snow, office manager, who has been acting general manager, will continue as district manager in charge of office accounting and sales, with Mr. Knowlton in charge of all operations.

The company's properties have a total daily capacity of 15,000 cubic yards of processed sand, gravel, ballasting and related materials.

Four major operations have been developed in addition to the company's home plant, serving the states of Utah, Idaho, Nevada and California.

A ballast plant at Sand Pass, Nevada, near the California border, supplies processed ballast and other materials to the western Pacific railroad, with an annual capacity of 250,000 yards of ballast and 150,000 yards of other materials. A similar plant at Evanston, Wyoming, serves the Union Pacific Railroad and has a capacity of 500,000 to 750,000 cubic yards, or a daily capacity of about 200 cars of ballast, sand and gravel.

A third operation is at Draper, Utah, where special graded sands for asphalt work, filtering and engine sands are produced. The Ready Mixed Concrete Company, a subsidiary, is also at Salt Lake City.

Dispute Over Bentonite Claim Aired in Court

A suit disputing the ownership of a bentonite claim in Crook County, Wyoming, was filed recently for judgment by the Wyoming supreme court at Cheyenne. The seven plaintiffs in the case charged 11 defendants with entering premises, removing bentonite and trespassing on land on which the plaintiffs had filed a claim, and for which $1,000 damages is sought.

In a counter claim filed by the defendants, it was charged that they were the possessors of a previous oil and gas lease to the land which voided the granting of the bentonite claim to the plaintiffs. A Crook country district court judge found generally in favor of the plaintiffs, although the land was divided between the two groups.

Industry's Leaders on 1942 N.A.M. Board

Membership of the 1942 board of directors of the National Association of Manufacturers, includes the following representatives in the pit-and-quarry industries:

M. C. Matthews, manager of operations, Oklahoma & Arkansas division, Ideal Cement Company; Redfield Proctor, president, Vermont Marble Company, and Blaine S. Smith, president, Universal Atlas Cement Company. The latter, besides serving as a member of the board, also is treasurer of the association.

Points Out Need for Lime on U. S. Farms

Bulletin No. 300 of the Virginia Agricultural Experiment Station reveals an interesting selling argument for liming materials, Arthur Bick, director of the Southeastern Lime Institute points out. Says the bulletin:

"When the average 1,000-pound beef animal or its equivalent in other livestock goes to market, 100 pounds of 20 per cent. superphosphate and 40 pounds of ground limestone leaves the farm in the bones of the animal. . . . In the case of dairy cattle, when milk is sold from the farm, a cow producing 10,000 pounds of milk yearly will deplete the farm of plant food equivalent to 330 pounds of nitrate of soda, 81 pounds of 20 per cent. superphosphate, 25 pounds of ground limestone, and 35 pounds of muriate of potash."

Amon Larkin, Early Excavating Expert, Passes Away at 89

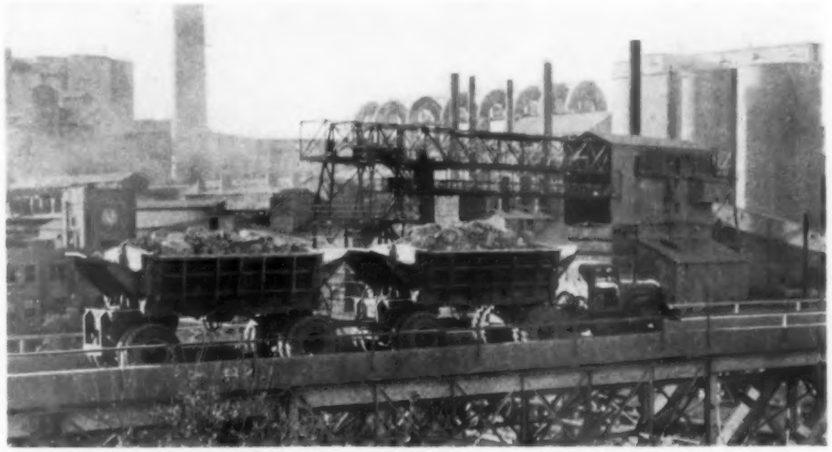
One of the pioneer figures of old-time methods of large-scale excavation in industry passed away at Syracuse, New York, recently when Amon L. Larkin died on the eve of his 90th birthday. Singularly enough, the thread of adventure which had followed him through the salt deposits of this region, the oil fields of Pennsylvania, the stone quarries of the midwest and Vermont, and elsewhere, wound into his life to the end.

Born in 1852, near Syracuse, he joined his father in salt-deposit excavations at a time when the vast untapped saline stores thereabouts had not gone into large-scale production. Some of the first forward steps in pit excavation, with short-cut efficiency methods as they were governed by the times, were credited to him. Later his services were in demand when an abortive natural-gas boom occurred in Indiana and Pennsylvania. Barre, Vermont, then claimed his abilities. In 1881, he moved to Pennsylvania where he was associated with a large building-materials company. He prospered moderately but preferred retirement near the scene of his birth.

Stockton Gravel Firm Acquires Second Plant

Robert Adams, owner of the Adams Sand & Gravel Company, has purchased the San Joaquin Gravel Company. The addition consists of 20 acres across the river from the other pit near Stockton, California. A bridge connects the two pits.

L. D. Dutton has been named manager.



These Gar Wood heavy-duty transport units, drawn by an Autocar Diesel tractor, are carrying stone from the quarry to the plant of the Marquette Cement Manufacturing Company, Oglesby, Illinois.

Prohibits Removal of River Gravel as Flood-Control Step

Seeking to protect lives and property along the San Gabriel River from El Monte to Long Beach, the Board of Supervisors in Los Angeles have ordered preparation of an ordinance to prevent further removal of sand and gravel from the cone dividing the rivers.

County Supervisor W. A. Smith, chairman of the flood control district, led the move to restrict excavation on the ground that it would defeat the regulatory purposes of the new $10,000,000 Santa Fe Dam.

Graham Brothers, Inc., important aggregates producer in the Los Angeles-Long Beach area, and owner of property which would be restricted, gave notice that the company would seek compensation in the courts for loss of material by the order prohibiting excavation.

Arkansas Firm Supplies Ordnance-Plant Gravel

The Producers Sand & Gravel Company, whose plant three miles north of Wilton, Arkansas, has been closed for three years, has been reorganized by Francis Jones and other stockholders of Shreveport, Lousiana and rebuilding of the plant and the three-mile railroad to the site has started.

The new plant will be electrically operated and will have a daily capacity of 50 carloads. It will furnish gravel and sand to the Lone Star Ordnance Plant at Texarkana.

The new plant, when completed, together with the gravel plant now in operation five miles northwest of Wilton, will deliver to the Kansas City Southern Railway at Wilton a daily total of 75 to 100 cars for shipment to the Texarkana area, according to Mr. Jones.

The Wolf River Pearl Button Works is a "co-operative" in the central Wisconsin town of Fremont. After blanks for buttons are cut out of clam shells they are ground in an O. B. Wise pulverizer. A shaker screen separates chicken grits from dust which is sold for agricultural purposes.

U. S. Bauxite Reserves Revealed as Limited

A survey of the bauxite resources of the United States, made recently by the Bureau of Mines and the Geological Survey at the request of Secretary of the Interior Harold L. Ickes, revealed that the estimated reserves of this important aluminum ore will be exhausted in less than six years if foreign imports are stopped and the present rate of defense consumption is maintained.

There are roughly 18,000,000 tons of commercial bauxite reserves in this country, a report of the joint survey disclosed, of which about half can be used without further concentration for making metallic aluminum vital for defense. The remainder is of a lower grade and would require treatment.

The Central Rock Company, Lexington, Kentucky, has started production of stone from a mine 265 feet below the surface at its plant. The old quarry will be abandoned shortly after full production gets under way in the mine.

T. Ward Havely, president of the company, is also mayor of Lexington.

An Invitation

To the Editor:

For a period during the War of 1914-18, I was on the British War Mission to the United States and received many kindnesses and great hospitality, particularly in New York City, Albany, Philadelphia, Baltimore, Bethlehem, Wilmington, Savannah, Omaha, Chicago, Kansas City, and in Northern Michigan.

I have not forgotten this, and with the possibility of United States forces coming to this country, I have the hope that I may be able to return this hospitality in some measure.

Derbyshire Stone Ltd., of which company I am managing director, is one of the largest quarrying organizations in Great Britain, with quarries and works in Derbyshire and Staffordshire, and if members of the American forces, interested in quarrying, should at any time be in this part of the country, I hope that they will not hesitate to call upon me, so that I might have the opportunity of showing them over our works and entertaining them in so far as the circumstances of the war permit.

Yours faithfully,

John Hadfield,
Managing Director.

"Manny" Hunt—One of Cement Industry's Pioneer Operators

"Manny" Hunt

Back in 1883, at the age of 18, Mansfield Hunt entered the cement industry, going to work for the old Howes Cave Lime & Cement Company. During the years spent with this company "Manny's" duties were many and varied, and ranged from drilling the natural cement rock with hand drill and striking hammer to hand dressing the 2-ton millstones which pulverized the burned cement rock. Three to four carloads of natural cement, known as "Rosendale," was a good average week's production.

In addition to the Howes Cave Lime and Cement Company, there was a competing concern known as the Howes Cave Association. After eighteen years with the former company Mr. Hunt saw it merge with its competitor, the new concern being known as the Helderberg Cement Company. The manufacture of natural cement was continued by the new concern for two or three years and then experiments were begun on the manufacture of Portland cement. These experiments were successful and Mr. Hunt assisted in the production of the new type of product.

For some time he served the Helderberg Company as quarry foreman, was then transferred to the position of mill foreman. In 1925 another merger took place. The Helderberg Cement Company became a part of the North American Cement Corporation. With this organization he served as construction foreman, later as mill foreman and today is still in the harness as relief mill foreman. His 76 years rest lightly upon him.

Fifty-eight years in the industry, still in the plant in which he started as a lad of 18! Mr. Hunt has seen water and steam power replaced by electricity, new and larger kilns installed, larger and more efficient machinery erected, and the personnel increased from eight or nine men to the 130 odd North American employees of to-day.

★ ★ ★ ★ ★
Insure the future of America. . . .
Buy Defense Bonds
★ ★ ★ ★ ★

CURRENT BUSINESS INDICATORS

News from the battle fronts continued to be almost wholly bad during the past month. The fall of Singapore, for example, represents a catastrophe of the first magnitude to the cause of the United Nations. In addition, serious reverses have been suffered in Libya, while the Japanese drive against Burma and the rich Netherlands East Indies has increased in intensity. Finally, the toll of submarine operations along the east coast has reached alarming proportions. Indeed, General MacArthur's gallant last-ditch stand against the Japanese in the Philippines and the Soviet offensive against the Nazi positions in Russia constitute about the only encouraging military news of the past month.

Although the turn of events on the battle fronts has been largely unfavorable, domestic industrial developments have been definitely encouraging. Detailed statistics on finished armament production are now secret. All evidence suggests, however, that both the President and Donald Nelson are completely satisfied with the progress that has been made since the beginning of the year. The primary reason for this feeling of satisfaction is believed to be that the production of many important items is running considerably ahead of schedule.

Despite the disruption of normal activity in many branches of industry, there are persuasive indications that industrial activity advanced to a new high level in January. Final indexes of the Federal Reserve Board are not yet available, but it appears reasonably certain that the seasonally adjusted index for January will stand at approximately 170 per cent. of the 1935-39 average. This compares with a revised index of 167 for the month preceding.

As in previous months, the most impressive gains in January were registered by the aircraft, shipbuilding, machinery, and railroad-equipment industries. Gains in these industries more than counterbalanced the declines that took place in the consumer-goods industries as a result of the war. Moreover, both power production and freight-car loadings advanced sharply during the month.

Construction activity continued at extremely high levels for this season of the year. According to the F. W. Dodge Corporation, building and engineering contracts awarded in 27 eastern states totaled $316,846,000 in January. This represents an increase of about 5 per cent. over the corresponding month of last year and is accounted for entirely by the substantial rise in non-residential building. The decrease in new residential building exclusive of hotels, barracks, and dormitory projects was 17 per cent. less than in the same month of last year, although the number of dwelling units contracted for was less than 2 per cent. lower. This difference reflects the trend in the direction of lower-cost housing units.

In the important metal-producing industries there has been relatively little change in the rate of operations during the past month. Steel production in January, according to the American Iron and Steel Institute, amounted to 7,129,351 net tons, the highest for any corresponding month on record and the fourth largest for any month in the history of the industry. Production of the non-ferrous metal has also been maintained at record-breaking levels in recent weeks.

Prices have continued to advance during the past month and are now at the highest level that has been reached during the past fifteen years. Moreover, in spite of the enactment of the price-control bill, it is expected that prices will continue to increase. Blanket ceilings on prices are not likely to be established by Price Administrator Henderson. Instead, the first moves will be against "unwarranted increases" and "out-of-line-prices." As a result, the cost of living is almost certain to advance by at least 10 per cent, during the course of the current year.

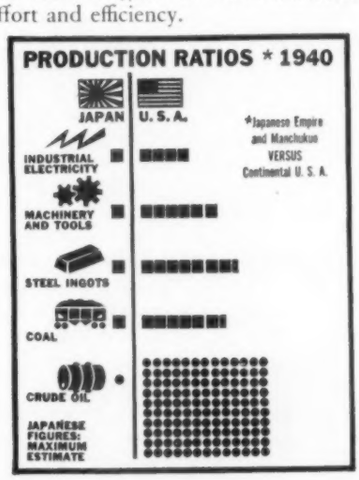
Meanwhile, the War Production Board is developing a plan for a spring production drive that is designed to obtain results comparable to the British arms-making program in the weeks immediately following Dunkirk. The plan now under consideration is to put on all the production pressure possible during the period of conversion of existing durable-goods industry to war work. Under this plan a system of incentives has been designed to evoke maximum effort and efficiency.

HOW WE ARE SPENDING THE DEFENSE DOLLAR

ORDNANCE (INCLUDING NAVAL ORDNANCE) 23 CENTS
AIRPLANES, ENGINES, PARTS, ETC. 17 CENTS
NAVAL SHIPS AND PARTS 13 CENTS
INDUSTRIAL FACILITIES 11 CENTS
STOCKPILES, OTHER EQUIP., ETC.
POSTS, DEPOTS, FORTIFICATIONS
PAY, ETC. (ARMED FORCES) •
OTHER MUNITIONS
MERCHANT SHIPS AND PARTS
(OTHER DEFENSE AGENCIES) •
HOUSING
PAY, SUBSISTENCE, TRAVEL, AND MISC.

THIS CHART SHOWS HOW THE DEFENSE DOLLAR is being spent. It is based upon a proportional breakdown of $71,100,000,000 appropriated and proposed for national defense as of November 30, 1941. This includes $60,000,000,000 voted for defense by Congress, including $13,000,000,000 for Lend-Lease purposes, plus commitments by the Reconstruction Finance Corporation and subsidiaries of $4,000,000,000, and additional sums totaling $7,100,000,000 requested by the President in recent messages to Congress.

Grant for OEM



The Victory Program ★ ★ ★ ★ and Your Business

AA Ratings. — Producers operating under the Production Requirements Plan are permitted to extend AA ratings without special permission from the Bureau of Priorities by an amendment to Preference Rating Order P-90 issued January 30 by the Division of Industry Operations. Producers operating under the Production Requirements Plan have been forbidden to make use of any preference ratings except those assigned on PD-25A application forms. The amendment makes an exception to this rule in the case of AA ratings, to avoid delay in the handling of rush military contracts.

Aluminum.—A new aluminum order, Conservation Order M-1-e, was issued by the Division of Industry Operations, WPB, on January 27. It prohibits the use of aluminum in any manufacture except on war contracts and the 15 items specifically set forth. Among these permissible uses only two are of interest to non-metallic-mineral producers:

(8) Pistons for engines of trucks (1½ tons and over), heavy-duty tractors, Diesel engines, and engines in portable fire-fighting equipment. Only low-grade aluminum which has not been debased shall be used for this purpose.

(9) Repair and Maintenance Parts for mechanical or electrical equipment used domestically or in industry: provided, that the manufacturer certifies in writing to the Office of Production Management, Ref.: M-1-e, that parts made of other material can not be used and that an equivalent weight of similar defective aluminum parts has been returned by the ultimate consumer and disposed of as provided in Supplementary Order M-1-d. Only low-grade aluminum which has not been debased shall be used for this purpose.

(10) Welding Rods.

Asphalt Prices. — By Amendment No. 3 to Price Schedule 88 (Petroleum and Petroleum Products), issued February 9, price increases on asphalt and asphalt products have been permitted. The maximum prices for paving asphalt, cut-back asphalt, asphalt emulsion and road oils shipped to a given destination shall be no higher than the weighted average of prices provided in the three contracts of sale (or sales if not preceded or accompanied by contracts of sale) governing the largest volume, made between July 1, 1941 and October 15, 1941, for a product of like specifications and quality shipped to the same destination. Should there be only two contracts, the maximum price shall be the average of the two sales. If neither of these methods can be used to determine the maximum price, then the maximum price shall be the price of the last contract pursuant to public bidding made prior to October 15, 1941,

★ ★ ★ ★ ★ ★ ★ ★ ★

WAR EFFORT INDICES

MANPOWER

National labor force, January	52,400,000
Unemployed, January	4,200,000
Nonagricultural workers, December	40,963,000
Percentage increase since June, 1940	14
Farm employment, February 1, 1942	8,940,000
Percentage decrease since June, 1940	25

FINANCE

June, 1940, to latest reporting date (millions of dollars)

Authorized program to February 15	*$109,828
Total disbursements to February 15	* 18,665

PRODUCTION

June, 1940, to latest reporting date (millions of dollars)

Paid on contracts, January 31	*$14,150
Govt. commitments for plant expansion; 738 projects, December 31	5,885
Private commitments for plant expansion; December 31	1,326

WEEK ENDED FEBRUARY 21, 1942

	Strikes	Workers
Significant strikes in progress during week	7	4,400
Number settled	4	2,900

* Preliminary.

★ ★ ★ ★ ★ ★ ★ ★ ★

to the same destination. If the seller is unable to set a maximum price by any of these three methods, he must compute it on the basis of the three methods, as if the sale were made for delivery to the destination nearest to the particular destination involved (nearest in terms of freight cost to the seller) and appropriate adjustments shall be made to reflect the difference in freight costs.

Cloth Bags. — Beginning February 16, 1942, second-hand bags may not be sold at prices above the highest prices received by a seller during the period October 1 to 15, 1941. The emergency price ceiling, imposed on December 16 as the result of the profiteering that followed the outbreak of the war, based maximum prices on the period November 15 to December 6. The new prices are designed to conform to the provisions of the Emergency Price Control Act of 1942 and were issued February 4 as an amendment to Price Schedule 55, OPA. "Second-hand bags" are redefined so as to make it clear that bags of jute, sisal, gunny cloth, or other textile material are covered in addition to those made of burlap or cotton, and that they have been used once or more to package any product and thereafter emptied and sold for re-use as a container.

Dr. Wilbur A. Nelson, head of the Mining Branch of the War Production Board, and E. W. Bauman, in charge of the Nonmetallic Division of that Branch, discussed the priority problems of the nonmetallic-minerals industries at considerable length at the Cincinnati conventions of the National Sand & Gravel Association and the National Crushed Stone Association and they answered questions asked by producers and machinery manufacturers in attendance. Their remarks are reported on pages 56 to 62 of this issue of PIT AND QUARRY.—Editor.

Coal and Coke.—Large users of coal and coke, especially utilities and industrial users, are being urged by the Division of Industry Operations, WPB, to build up their inventories as much as possible to avoid the danger of having to suspend operations in case of an emergency. General Inventory Order M-97, issued February 13, revokes the inventory restrictions imposed by Priorities Regulation No. 1 in so far as they apply to coal and coke. This order was issued upon recommendation of the Office of Solid Fuel Coördinator. The order will enable large users to take advantage of the fact that there is at present considerable excess production of coal and coke, and transportation available for the distribution of these materials. Inventory restrictions are relaxed for coal and coke only. Inventories of all other materials must be kept to a practicable working minimum in accordance with the terms of Priorities regulation No. 1.

Conveyors.—Producers of conveyor machinery and auxiliary equipment are eligible for priorities assistance under the Production Requirements Plan and should file the necessary application forms (PD-25A) with the Industrial and Office Machinery Branch as quickly as possible, it was announced February 3. Assistance to manufacturers of this heavy machinery, which is used to transport materials in and around mines and manufacturing plants, previously had been available under Preference Rating Order P-78, which expired January 31. Under this order an A-3 rating was applied to deliveries of materials going into the manufacture of the equipment. The Industrial and Office Machinery Branch will process all PD-25A forms received from the manufacturers. Unless these forms are filed, manufacturers can not qualify for assistance under the Production Requirements Plan.

Cranes and Hoists.—Preference Rating Order P-S-b, which provides for the assignment of preference ratings to cover the needs of manufacturers of cranes and hoisting equipment, has been extended to May 1, 1942.

Laboratories.—On January 23 the WPB made it clear by Interpretation No. 1 of Preference Rating Order P-43

of August 28, 1941, that the order may not be used to obtain material to be used in the construction of laboratory buildings or other structures. The only material which may be obtained under the order by a laboratory is that which will itself be used in the conduct of scientific research or which will enter into the production of material which will be so used.

Machine Shops.—Machine shops, motor-rewinding shops, job platers and other shops performing industrial repairs are eligible for priority assistance under the Production Requirements Plan (PRP, or "purp" as it is commonly called) or the Modified Production Requirements Plan for small business, the Division of Industry Operations, WPB, announced February 5. By submitting applications on Form PD-25A or PD-25X, according to the size of their business, companies of these types may obtain a priority rating or ratings to be used over a calendar quarter-year for specified quantities of materials. The rating assigned and the quantity of material which it may be used to obtain will depend upon the volume of war or essential civilian work being handled by each company.

Passenger-Car and Light-Truck Parts.—Sharp acceleration of the production of spare parts for passenger cars and light trucks (less than 1½ tons) to form a stock-pile for future needs was authorized by the WPB on January 23. Under it the new order (Extension No. 2 and Amendment No. 1 of Limited Preference Rating Order P-57) manufacturers may make during the first half of 1942 up to 150 per cent. of the number of each of the replacement parts sold by them for that purpose during the entire calendar year 1941. These limitations do not apply to Army, Navy, lease-lend orders and the like. An A-10 preference rating is made available to manufacturers and suppliers to obtain materials going into the manufacture of spare parts, but it can not be applied to deliveries of materials on purchase orders placed after June 1 nor on orders calling for delivery after June 30. The rating can be applied only for materials for the following repair parts and components: Engine, clutch, transmission, propeller shaft, axles, brakes, wheels, hubs, drums, starting apparatus, spring suspension, bracket and shackles; the exhaust, cooling, fuel, lubricating and electrical systems, including generators, lights, reflectors and batteries; and gages, speedometers, motors, fuses, flares, directional signals, rear-view mirrors, windshield wipers, control mechanisms, steering apparatus, and driving gears.

"P" Orders.—Limitations imposed by reference to the Priorities Critical List of the Army and Navy Munitions Board in a number of preference-rating or "P" orders were removed February 11 by the issuance of Priorities Regulation No. 6. A number of general preference orders which were written prior to August, 1941, when the Critical List was last amended, provide that the ratings assigned by such orders shall not be applied except to items which appear on the list. The regulation just issued removes this limitation and allows the ratings assigned by any "P" order to be used on deliveries of any material otherwise covered by the order. It does not, however, remove any special restrictions or special materials lists which may be specifically included in the terms of any order.

The Defense Housing Critical List, which constitutes a limitation on the use of preference ratings assigned by Defense Housing project ratings, remains in full force and effect.

The purpose of Priorities Regulation No. 6 is to eliminate the necessity for a large number of individual applications on PD-1A forms for ratings to be used in obtaining material by industries which operate under "P" orders, but have been limited heretofore by the Priorities Critical List.

The Priorities Critical List, as it applied to ratings assigned under the Army and Navy Munitions Board directive, was abolished effective February 2, by an amendment to Priorities Division Administrative Order No. 1 which was issued by the Priorities Division of OPM before creation of the War Production Board, and subsequently validated by WPB.

PD-1A.—A warning was issued January 30 by the Bureau of Priorities against the use of PD-1A application blanks which had been reproduced privately up to that time. Copies of the form as it was originally drafted were inaccurate and could not be accepted as valid applications by the Bureau of Priorities. The new official form may, however, be reproduced, provided the reproduction is in the exact form of the original.

Priorities Regulations.—Priorities Regulation No. 3, governing the use of Preference Rating Certificates PD-1A and PD-3A and the extension of preference ratings thereunder, became effective February 2. It provides that:

> On and after February 2, 1942, all individual Preference Ratings may be assigned, and on and after March 1[1], 1942, must be assigned on the new forms PD-1A and PD-3A. Between February 2 and March 1[1], Preference Ratings may continue to be assigned on Preference Rating Certificate forms PD-1, 2, 3, 4, and 5.
>
> Form PD-3A will be used to assign Preference Ratings to deliveries under purchase contracts of the Army, Navy, and certain other Government agencies specified in Priorities Regulation No. 3.
>
> Form PD-1A will be used as an application for priority assistance on material other than material purchased by the Army, Navy, and other specified Government agencies, and other than material which can be procured under a Preference Rating Order ("P" Series).
>
> If the requested priority assistance is granted, the application is converted into a Preference Rating Certificate by placing the rating and the signature of the Director of Priorities on the form, which is then returned to the applicant.
>
> Form PD-1A may not be used to apply for a Preference Rating on requirements for plant expansion or plant construction. Application forms for such requirements (Form PD-200) may be obtained from the Director of Priorities, Washington, D. C., or from any Priorities Field Office.
>
> Preference Ratings assigned by forms PD-1A and PD-3A may be extended by endorsing on the purchase order the form of certification prescribed on each form. Extension of preference ratings is restricted to deliveries of material to be physically incorporated into material to be ultimately delivered to the original recipient of the preference rating, or to replace in inventory material delivered on orders rated under Preference Rating Certificates.
>
> A supplier or subsupplier who has received two or more contracts or purchase orders bearing the same ratings, originally assigned by Certificates PD-1A and PD-3A, may include in a single purchase order, and may extend such rating to, the material which he in turn requires to make delivery in accordance with such contracts or purchase orders, or to replace in inventory material so delivered.
>
> Form PD-1A may be reproduced in blank by or for the user: Form PD-3A may not be reproduced. Form PD-1A may be obtained from the Director of Priorities, Washington, D. C., or any of the Priorities Field Offices; Form PD-3A may be procured from duly authorized inspecting, contracting, and procurement officers of the Army and Navy.

[1] [Since extended to March 15.—ED.]

Refractory Brick.—Three manufacturers of refractory brick have signed agreements with the OPA to maintain present prices on all grades of such brick for three months, according to an announcement made by Leon Henderson February 2. The manufacturers who signed the agreement are: E. J. Lavino, Philadelphia; General Refractories Company, Philadelphia; and the Harbison-Walker Refractories Company, Pittsburgh.

Relaying Rails.—Price Schedule 46 covering relaying rails was amended February 3 to extend the time for filing reports of purchases and sales from 10 to 15 days following the transaction and to allow a purchaser's agent a commission up to $1 per gross ton provided that the agent is not related to the purchaser in any beneficial capacity as an employee or otherwise. Denver has been added to the list of basing points included in the schedule. The ceiling price on relaying rail purchased on the basing-point basis has been devised so

★ ★ ★ ★ ★

To keep 'em flying, keep on buying
Defense Stamps and Bonds

★ ★ ★ ★ ★

that it need not be less than $24 per gross ton in any case. The warehouse ceiling price on carload lots has been lowered from $32 per net ton to $32 per gross ton. Provision has been made, however, for the allowance of a charge for reconditioning extras demanded by the consumer at a scale established in the schedule. Relaying rail is now defined as "rail, (1) which weighed 35 pounds or more per yard when new, (2) which is suitable for relaying, and (3) which has been submitted to all reconditioning processes, if any, necessary to render it fit for re-use as rail."

Reproduction of Forms.—All priority forms and orders, with a few exceptions, may now be reproduced, according to the terms of Priorities Regulation No. 5, issued February 5 by the Division of Industry Operations. The regulation applies to all documents heretofore issued, and to those issued hereafter, except in cases where reproduction may be specifically prohibited. Copies of any order which contains the name and address of the producer or other person to whom the order is issued, or a serial number identification, may not be reproduced without the name and address and serial number unless they are clearly marked "Information Copy."

Reproduction for use of the new application form, PD-1A, is permitted if copies are identical with the officially published version as to wording, paragraphing, punctuation and size, and substantially the same as to color and paper.

The new Form PD-3A may not be reporduced for use, but copies clearly marked "Specimen Copy" may be made for purposes of information.

Reproduction of the following forms and orders is prohibited except where the reproduction of a form as distinguished from an order has the words "Specimen Copy" clearly set forth on the face thereof: PD-1-c, PD-3, PD-3A, P-25-a through P-25-e, P-26-a through P-26-e, and P-35.

Reproduction of the following orders is limited to reproduction by or for producers (not suppliers) operating under said orders: P-3, P-4, P-9-a through P-9-g, P-13, P-15, and P-52.

Reproduction of the following order is limited to reproduction by persons entitled to apply the preference rating: P-41.

Rubber Goods.—Stringent rules for the guidance of manufacturers of various essential rubber products are laid down by the WPB in Supplementary Order M-15-b-1, the first order of its kind, issued February 11. It is designed to save at least 25,000 tons of crude rubber a year by limiting the percentages of crude rubber in mixtures used to make these products. Forty per cent. of the saving is expected to come from the decreased use of rubber in tires and tubes and the specifications covering the use of rubber in capping stock for civilian use. There will be approximately 15 per cent. less new rubber in civilian tires. The tires and tubes affected by the new order may have a shorter life but they will not be less safe than those formerly made.

The following restrictions are of interest to nonmetallic-mineral producers:

Conveyor Belts and Belting, Elevator Belts.—To be made in two grades only:

Grade A, having 2,500 to 3,000 p.s.i. tensile strength and 16- to 19-pound friction.

Grade B, having 800 to 1,000 p.s.i. tensile strength and 12- to 15-pound friction.

Both with black covers only.

Flat Transmission Belts and Belting.—To be made in two grades only:

Grade A, having 20- to 24-pound friction.

Grade B, having 12- to 15-pound friction, and no skim coats.

If made in colors other than black, no more rubber to be used than if made in black.

Waterproof Boots.

Type	Average Weight of Rubber in Pounds
Men's short	1.25
Men's storm king	2.00
Men's hip	2.30

Tire, Tubes, Casings, and Capping Stock.—Specifications quite complicated, being based on sizes and types. See the order for full details, if interested.

Fire Hose and Mill Hose—Number of sizes reduced to four: 1½-, 2½-, 3- and 3½-inch. The amount of rubber used is considerably reduced.

Speed-Reducers.—Formal price ceilings, based on October 15, 1941, levels, are established on gears, pinions, sprockets and speed reducers under Price Schedule No. 105. The schedule, effective February 18, is the first in this particular line. It is also the last schedule to be filed prior to Mr. Henderson's official induction into office. In the future, there will be maximum price regulations and temporary maximum price regulations.

Gears, pinions, sprockets and speed-reducers are essential in transmission of power and a necessity in the war production program. During 1941 the prices of these articles increased sharply. The demand lately has far outstripped even a more than doubled output, so that, barring price curbs, prices would be expected to continue upward. A verbal request to gear manufacturers to refrain from selling at prices higher than those in effect October 1 to 15, 1941, was made January 27 at a Washington meeting with the industry, at which Joel Dean, price executive of the machinery section, presided.

This was followed by the formal order, indicating that no manufacturer producing these articles for sale separately shall charge more than his net price in effect October 15, 1941. On non-standard products, manufacturers are to compute the price to be charged on the basis of labor rates and material costs as of October 15, 1941, by use of the estimating formula used by them as of that date.

In a new approach to the classification problem, OPA has set up three categories: standard, recurring specials and special items.

Standard items are defined by OPA as those in price lists in effect October 15 last. They are forbidden to be sold in excess of the October 15 price, which is the list price, less all applicable discounts as of that date. In this way provision is made for the price differentials based upon quantity differences, which are customary in this industry.

Special items are those which have never been made before. They are to be priced on the basis of October 15 labor and material costs by use of estimating methods and price-setting standards employed by the manufacturers on that date.

Recurring specials are defined as any item of which two orders have been or may be received subsequent to February 18, 1941, and of which $1,000 worth for 500 items have been sold during that period. When an item which has been sold during the year ending February 18, 1942, is first sold after February 18, the price is to be set the same way as for a special item, except that the manufacturer is to use his experience as to machine hours and materials required for the order. The price charged on that sale then becomes the maximum price for all subsequent orders.

When an item is first sold after February 18 next as a special item and then, because of a repeat order or repeat orders, becomes a recurring special, the manufacturer is likewise to use his production experience in pricing the item for the later sale. In this case, the price charged on the later sale of the item under the schedule becomes the maximum price.

A system of monthly reports covering sales of those products defined as recurring specials is provided for in the schedule. One form is to be used if a previous sale of the item was made prior to February 18, 1942; another form if the item was sold for the first time after that date and there is a repeat order.

Sulphur.—The Freeport Sulphur Company, one of the country's largest producers of sulphur, has voluntarily offered to continue to sell sulphur througout 1942 at the 1941 base price of $16 a ton f.o.b. mines, according to an announcement by Price Administrator Leon Henderson. The company operates mines at Grande Ecaille, Louisiana, and Hoskin's Mound, Texas.

Retreaded and Recapped Tires.—Nation-wide rationing of retreaded and recapped tires began February 23. It is quite probable, Price Administrator Leon Henderson announced, that there

will be no crude rubber available for retreading, except for the small number of vehicles already eligible to obtain new tires and tubes.

"The amount, grade, and type of 'camelback'—the rubber compound used to form a new tread on worn tires—manufactured is determined monthly by the War Production Board," Mr. Henderson stated. "A certain amount will be made each month to permit the retreading or recapping of truck tires. None was available in February for the retreading of passenger-car tires and, perhaps none for the month of March. Events will dictate the future production of this material. OPA is providing regulations broad enough to ration as much camelback as the War Production Board can make available out of our limited rubber supply."

Rationing of retreaded and recapped tires, the process of retreading and recapping, and of all grades and types of camelback will be carried out by using the same machinery now employed to ration new tires and tubes. Tires for passenger cars, trucks, buses, farm implements, road-grading equipment, and motorcycles are all subject to the rationing regulations. These regulations have been revised substantially to encompass the new and greatly enlarged program and copies already are in the mails for delivery to every local rationing regulations broad enough to ration will be administered by the Office of Price Administrator under a "directive" issued by Donald M. Nelson, chairman to the War Production Board. This directive has been supplemented to delegate to OPA the authority to ration camelback and retreaded tires at the wholesale level.

Two eligibility lists, designated A and B, are contained in the new regulations. List A, except for the addition of clergymen, is generally the same as it has been under the new-tire rationing plan. List B is new and is confined exclusively to vehicles eligible to apply for certificates for retreaded or recapped tires. No list B vehicle was able to obtain a retread during February and, in the case of passenger cars, possibly will not be during March. List B truck-tire certificates will be issued only during the last several days of each month and then only if any retreads are left over after the demands of List A truck eligible have been satisfied.

The B List has been made broad purposely so that the rationing boards may use whatever camelback is made available to provide for the numerous contingencies that arise in various sections of a country as large as the United States.

Complete February quotas by states, giving the amounts of new tires and tubes made available to eligible passenger cars, trucks, buses, and other vehicles, and the amounts of retreaded truck-size tires for the month have been announced.

The February quotas showed a sharp drop in the number of new tires allotted for trucks, buses and other heavy vehicles, reflecting the newly-added retread quotas. On an over-all basis the number of new and retreaded tires available in February in truck sizes was larger than the January quotas, which were confined to new tires alone.

As will be seen from List B, below, the eligibility classifications are confined to passenger-car users, excepting for a single classification, "Trucks used for any important purpose, not included in List A." The importance of the truck will be determined in each case by the local boards in relation to the needs of the community. Retail milk and food deliveries in many areas are obvious examples.

"The eligible classes in List B are not automatically qualified to purchase retreaded or recapped tires," Mr. Henderson said. "The regulations require anyone on List B to establish to the satisfaction of the local board that his car is used exclusively on service essential to the community and to the nation. There will only be a comparatively few vehicles in each community that will be able to pass this test. And, with supplies of camelback severely limited, only a few of those who can qualify are likely to get retreaded tires. Whenever the rubber situation permits, the quotas will be increased so as to make retreaded tires available to a greater number of those persons on List B."

The following sections of the eligibility lists are of interest to nonmetallic-mineral producers:

LIST A.

(e) A vehicle with a capacity of 10 or more passengers operated exclusively for one or more of the following purposes:

(3) Transportation of employees to or from any industrial or extractive establishment, power generation or transmission facilities, transportation or communication facilities, construction project, or farm, except when public transportation facilities are readily available;

(f) A truck operated exclusively for one or more of the purposes stated in the preceding sections or for one or more of the following purposes:

(1) Transportation of materials and equipment for construction or for mechanical, structural, or highway maintenance or repair;

(5) Transportation of raw materials, semi-manufactured goods, and finished products, including farm products and foods: *Provided*, That no certificates shall be issued under this paragraph for a tire or tube to be mounted on a truck used for transportation of commodities to the ultimate consumer for personal, family, or household use:

(h) Industrial, mining, and construction equipment, other than automobiles or trucks, for the operation of which rubber tires or tubes are essential.

LIST B

(a) A passenger car used principally to provide one or more of the following transportation services:

(2) Transportation of persons to enable them to render construction or mechanical, structural, or highway repair-maintenance services;

(3) Transportation of executives, engineers, technicians, and workers to and from, or within, such of the following as are essential to the war effort: power generation or transmission facilities, transportation or communication facilities, or agricultural, extractive, industrial, military or naval establishments;

(6) Transportation of traveling salesmen who are engaged in the sale of farm, extractive, or industrial equipment, foods or medical supplies, the distribution of which is essential to the war effort;

(b) Trucks used for any important purpose not included in List A.

The effective date of the plan was selected in order that all persons who had tire carcasses in retreading establishments for retreading or recapping could arrange either to have the work finished before that date or get their old tires back. After February 19 no retreaded tires could be obtained, even though the work had been on order for some time and even though the worn tire was owned by the person who ordered the job, except against a certificate issued by the local board. Carcasses left for retreading, but on which work had not been completed by February 19, could be repossessed by the owner at any time.

As revised, the tire rationing regulations contain substantial changes from those under which new tires alone have been rationed.

It is now provided that only "new-tire" certificates will be issued to List A passenger cars unless the "new-tire" quota is exhausted, in which event a "retread" certificate will be issued if there is any passenger car camelback available. Formerly a List A passenger-car operator could not obtain a "new-tire" certificate unless the board could be satisfied that the old tire could not be retreaded.

The change was necessary in order that as much as possible of any passenger car camelback allowed to be made will be available to applicants who can qualify under List B. It is hoped that such essential categories as defense workers and others engaged in direct war work will thus be given some chance of getting a retreaded tire whenever camelback is available. With no restriction on retreads pleasure cars and other unimportant vehicles overburdened retreading facilities and crowded out workers in war plants. Whenever passenger-car quotas for camelback are established, in certain instances, some retreads may become available for rationing to taxicabs in communities where other public and private transportation facilities are absent or inadequate. If passenger car retread quotas are set up, there will be no distinction drawn between List A eligibles and List B eligibles.

Truck-tire eligibles in List A will not be given certificates to purchase any new tires unless their old tires can not be retreaded. However, the needs of List A truck eligibles must be satisfied in every case ahead of those of a truck on List B. List A trucks and other heavy vehicles could apply for retreads as soon as the plan became effective.

The former broad provisions regarding the purchase of so-called "obsolete" tires for passenger cars, which in general applied to tires for cars more than 10 years old, has been replaced by a provision prohibiting the sale of "obsolete" tires except to passenger cars on either List A or List B.

As is the case with "new-tire" purchase certificates, the "retread" certificates are good for 30 days and can be exercised anywhere. If

★ ★ ★ ★ ★

Buy a security that means security

—A Defense Bond or Stamp

★ ★ ★ ★ ★

desired, a certificate holder either can buy a retreaded or recapped tire or have a worn tire retreaded or recapped. Any tire, replaced by a new or retreaded tire, assuming no "carcass" was provided, must be turned in.

Since OPA has established maximum prices for new tires and for retreads and the process of retreading, the certificates can only be exercised within the limits set by the applicable ceiling schedule. All dealers and retreaders are required to post these maximum prices prominently in their establishments.

The new regulations contain various dates governing the issuance of certificates by the local boards. It is stipulated that no certificates for the purchase of passenger car retreads can be issued until March 2, by which time it will be known whether or not any passenger-car camelback will be available for that month. The War Production Board has not permitted the manufacturer of any passenger car camelback using crude rubber during February, and there is virtually none available.

No certificates for List B truck retreads out of March quotas can be issued until March 25 and then only during the remaining days of that month. Applications for such certificates, however, can be filed between March 1 and March 20 and no application will be accepted after the latter date until April 1. The same procedure will be followed in each succeeding month as to truck retreads for List B vehicles, so that demands of List A vehicles can be taken care of first.

The mechanics by which a retreading establishment will be able to replenish its stock are simple. Every establishment having truck-tire molds will be given an initial allotment of truck-tire camelback sufficient to bring the total truck-tire camelback in its possession to 750 pounds per truck mold. Those already possessing more than 750 pounds per truck-mold will not be given any additional camelback and, conversely, establishments with no inventory will receive the full amount. Applications for this initial allotment must be filed by retreading establishments by March 1 with the local rationing boards on forms that will be provided for this purpose. Purchases of camelback to make up the allotments must be completed by May 1.

Excepting for this initial allotment, the flow of camelback from manufacturer to retreader will follow the flow of the "replenishment part" of retread certificates issued to eligibles by the local boards. Sale of camelback by a manufacturer against the presentation of the "replenishment part" of a certificate is not compulsory.

However, Mr. Henderson said, if it is found that retreading establishments are unable to obtain their fair share of available camelback even though holding "replenishment" certificates, OPA may find it necessary to institute compulsory allocation of camelback.

Sales of camelback and retreaded or recapped tires back to suppliers (*i. e.* "upstream") are permitted without restriction.

Track-Laying Tractors.—The War Production Board on February 19, issued an order prohibiting the sale or delivery of unused track-laying tractors and certain auxiliary equipment in the possession of manufacturers, distributors and dealers. The equipment covered by the order includes bulldozers, angledozers, power-control units and winches to be mounted on unused track-laying tractors. An exception was made in the case of persons whose orders have been assigned a preference rating higher than A-2.

The order—L-53—was made to insure meeting the military and essential demands for track-laying tractors and equipment to be mounted on them. The constantly increasing requirements for this type of equipment by the armed forces and Lend-Lease alone indicate a demand that possibly will exceed the 1942 productive capacity of the industries.

Truck Parts.—Orders designed to facilitate the production of spare parts for medium and heavy trucks, truck trailers, passenger carriers and school bus bodies were issued January 22 by J. S. Knowlson, Acting Director of Priorities, WPB.

Under Limitation Order L-35, producers may make during the first quarter of this year 60 per cent. of the number of designated replacement parts sold by them for replacement purposes during the last half of 1941.

Under Limited Preference Rating Order P-107, an A-3 rating is assigned to deliveries of materials going into the manufacture of these spare parts.

Medium and heavy trucks mean complete motor trucks or truck-tractors weighing 9,000 pounds or more; truck trailers are those having a cargo-carrying capacity of 5 tons or more; passenger carriers mean motor or electrical coaches seating 15 or more persons; and school bus bodies mean complete bodies designed and constructed primarily to transport children of school age. The definition of replacement parts is considerably enlarged over that contained in previous orders.

Under the limitation order (L-35) the Director of Priorities may alter the production restrictions from time to time to offset curtailments that may occur in some plants as the result of conversion of facilities to war work. No restrictions are placed on production for the Army and Navy and certain other government agencies, designated foreign governments and to fill lend-lease requirements.

The A-3 preference rating may be applied by a producer or a supplier to obtain deliveries of materials necessary to produce the permitted number of spare parts. The rating can not be applied if enough materials are already in inventories to meet the production quota and still leave a producer or supplier with a practicable working minimum inventory. It can not be assigned to deliveries on purchase orders placed after March 1, nor on orders calling for delivery after March 31.

The parts to which the A-3 rating applies are listed in Preference Rating Order P-107 as follows:

(5) Replacements Parts means only the following parts (including components entering into such parts) used for the repair or maintenance of heavy trucks, medium trucks, truck trailers, passenger carriers, and school-bus bodies: engine, clutch, transmission, power dividers and take-offs, transfer cases, propeller shafts, universal joints, axles, braking system, wheels, starting apparatus, frame and spring suspension assemblies, shock absorbers, speedometers, fuses and flares, directional signals, driving mirrors, windshield-wiper assemblies, steering apparatus, coupling devices, trailer landing gears; exhaust, cooling, fuel lubricating and electrical systems, including generators, starters, motors, lights, reflectors, signal horns, batteries; fenders, hoods, doors and door hardware, radiator guards, defroster heaters; truck refrigeration units, liquid-measuring gages; and, but only as to parts for passenger carriers and school-bus bodies, body structural repair parts, sash, seats, destination signs, fare boxes, guards and grab rails, door operating mechanisms, signaling devices, heating and ventilating equipment.

Trucks and Trailers.—A 34-per cent. increase in the production of medium and heavy trucks during the month of March over the same month of 1941 was authorized by the WPB on January 24, but it ruled that such machines could not be equipped with tires, casings or tubes. Tires and tubes may be used only to assist in delivering the vehicles to dealers, after which they must be removed and returned to the vehicle manufacturer. The effect of the order will be to create a stock-pile of medium and heavy trucks for essential civilian uses. The vehicles in this stock-pile will be released under a rationing plan to be put into effect and in such cases the government will undoubtedly provide four tires and tubes if these are not otherwise obtainable. Deterioration of tires linted on vehicles standing for long periods in dealers' storerooms will be avoided.

In addition to permitting stepped-up production of medium and heavy trucks WPB authorized unlimited production during March of passenger carriers (15 or more persons) and truck trailers (5-ton capacity or more).

There will be no further production of passenger cars and light trucks (less than 1½ tons).

An A-3 preference rating is made available in Amendment No. 2 and Extension No. 3 of Preference Rating Order P-54 for deliveries of materials going into the manufacture of medium and heavy trucks and passenger carriers, but the rating can not be applied to the deliveries of tires, casings, or tubes to equip the medium and heavy trucks.

Correction

The C. W. Poe Company, Cleveland, mineral-wool producer which recently disposed of its manufacturing plant to the American Rock Wool Company, is continuing in business as always under an exclusive selling contract with the American Rock Wool Company, according to C. W. Poe.

In announcing the transaction in the February issue, the company was erroneously referred to as the "W. G. Poe Company."

EDITORIAL

Enemy Voices Within

AS powerful as any enemy outside our borders is the incessant and foolish prattle of the enemies within. No less ominous than the threats of physical attack on our shores, so recently brought to grim reality, are the assaults on our national unity of purpose made by those who, through malice or credulous simplicity, spread doubts, rumors and falsehoods among us. While the depradations of the enemies of democracy demand the exertion of our utmost efforts in ingenuity, courage and persistence in physical defense, the machinations of the "friendly enemies" within call for the fullest exercise of our powers of discrimination and discretion.

In order to appraise at their true values the dozens of propaganda-born utterances that assail many of us in the short space of each week's contacts with our fellow citizens we must remember that a large number of groups, organizations and "movements," that thrive in the favorable climate provided by our ideals of liberty, equality and tolerance, exist for no other purpose than the poisoning of our minds, the destruction of our faith in the democratic way of life, and the retardation of our defense activities. They are definitely committed to the policy of "boring from within," of shaking confidence, of disseminating misgivings about the integrity and ability of public officials in high places and about our ability as a people to accomplish the great task to which we have set ourselves. They seek to destroy us by destroying our faith in ourselves.

They know the natural love of a parent for his son, and they speak slyly of what they call the "conditions" that allegedly exist in the camps where men for the Army and Navy are being trained. The father and mother who spared neither effort nor expense in the education and nurturing of their boy are told of "bad food," the unwholesome "sexual environment," the discomforts and privations which "they say" are associated with regimented life in preparation for war. They hope to make their listeners reluctant to let their sons make the sacrifices that the preservation of human freedom demands and so to obstruct the building of a great fighting force.

They know the natural love of a man for the country of his birth, so they tell him of the danger of "leaving his homeland undefended" while ships, planes and men are sent to meet the enemy in foreign lands and foreign seas. They hope thus to immobilize forces which, if free to go where they are most urgently needed, will bring ultimate defeat to those in whose interest these alarmists work.

They know full well the average man's desire to improve his economic position through the opportunities provided by free enterprise, so they attempt to frighten him by holding up the bogy of Communism, asserting with complete assurance that Russia, if successful in defeating Germany, will then overrun Europe and finally attack and destroy the capitalistic system in America. They hope in this way to impede our efforts to help one of our most powerful allies.

They know the power of self-interest as a factor in determining a man's actions and those of a nation, so they speak ill of the British, belittle the efforts they are making against the crushing attacks of the Nazi aggressor, and remind us of the American revolution against a weak and foolish king. By such methods they hope to retard our efforts to help Britain with men, materials and munitions.

They know the effectiveness with some people of appeals to race prejudice, so they talk disparagingly of the Japanese, saying that our real fight is against them, that the white races must unite to stop "the rising tide of color." They hope thus to divert our attention, our determination and our fighting forces from Germany, which is still the original and most dangerous enemy of human liberty, and lessen our power to resist her encroachments.

They know the average man's mistrust of politicians, so they whisper malicious comments about men in public office, men in positions of public trust, men in our armed forces, saying, with a meaningful smile that "We haven't heard the last of Pearl Harbor." They expect that propaganda of this sort will undermine our faith in our ability as a nation to meet the challenge that has been flung at us by the enemies of democracy everywhere.

OF course, most of us like to believe that we can recognize this type of gossip for what it is, yet some of our newspapers—even such as brag of their international supremacy—lend the weight of their authority—or what remains of it—to the dissemination of claims and suggestions, doubts and questions that have no firmer basis in fact than the few examples cited. What is worse, their effusions, oblique hints and malicious cartoons are quoted in circles that like to be known as "polite" and "intelligent," and "our best people"—unwittingly as often, perhaps, as deliberately—become parties to the spreading of slanders, defamations and fictitious stories that may severely handicap us as a nation in the prosecution of the war effort.

Since most of us read the same newspapers and have access to the same facts, the parrot-like repetitions of widely-printed reports to which one is exposed on every side appear to be needless expenditures of mental and vocal effort that might be applied to advantage in other ways. Yet that is the freedom of speech for which our forefathers struggled through centuries, and it makes no distinction between facts and fiction, except for the legal responsibility imposed on the reckless and conscienceless speaker.

And, although most of us have practically no knowledge of military strategy or tactics and could not qualify as experts or even as well-informed citizens, that does not deter us from making caustic comments on what has been or should be done. Yet that is the free expression of opinion to the maintenace of which, among other things, we have dedicated a whole nation in the most violent struggle of peoples and principles of all time.

With profit to the nation as a whole every one of us can adopt a saner attitude in our discussions of the war. We can try to weigh our words, to see through the veils of plausibility thrown over the lies that are told to us, to refuse to repeat anything that might give help to the enemy, to hesitate to believe anything that can not pass the test of credibility. That is a form of all-out effort to which everyone can make some useful contribution.

Sand, Gravel, Ready-Mix Operators Seek Solution at 1942 Conventions to Problems Raised by War

WIDESPREAD interest in the problems raised by war brought an unusually large number of visitors to the twenty-sixth annual convention of the National Sand & Gravel Association, held at the Netherland Plaza, Cincinnati, January 28 to 30. Two hundred and seven executives and operating men representing 125 separate sand-and-gravel producing companies registered, and there were 150 men representing ready-mixed-concrete manufacturers attending the twelfth annual convention of the National Ready Mixed Concrete Association which was held concurrently in connection with the gravel gathering. The Machinery and Equipment Exposition which was open throughout the three-day period was participated in by 42 machinery and equipment manufacturers and the two trade magazines serving the two industries. The exposition was the largest in the history of the two associations.

The first day's sessions began with addresses by the presidents of the two organizations.* In his opening remarks Joseph H. Dixey, president of the ready-mixed-concrete group, drew attention to the difficulties presented by the jurisdictional disputes among labor organizations interested in the industry. More troubles of this type can be expected, he said. Another problem of importance is that raised by the government's recapture of ready-mixed-concrete trucks, which has placed these machines on government projects and deprived the concrete manufacturer of the opportunity to bid on the jobs involved. Mr. Dixey said that on 20 large defense projects for which bids were received on ready-mixed-concrete the average price per cubic yard of 2,500-p.s.i. material, or its equivalent by arbitrary proportioning, was $7.30, or $3.65 per ton. He said it is the duty of the industry to prevent, if possible, the unnecessary use of vital materials, when adequate plant and equipment are available for use within the industry and their use will be of economic benefit to the Government.

Another joint session of the two bodies held Wednesday afternoon was devoted to discussions of the construction outlook, highways during and after the war, and construction in the war emergency. The papers presented are reviewed on pages 53 to 55 of this issue of PIT AND QUARRY.

Two evening sessions covered special problems of interest to sand-and-gravel producers who operate dredges and other floating equipment and a discussion of the design of concrete mixtures of interest to ready-mixed-concrete manufacturers.

Among the questions considered at the meeting of sand-and-gravel producers who operate dredges and other floating equipment in the navigable waters of the United States was the plan of compliance worked out by the National Sand & Gravel Association and the Wage and Hour Division of the Government. The discussion of unemployment - compensation insurance for employees with maritime duties made it clear that many operators are not sufficiently informed on this subject and that enforcement by the authorities has been lax in some sections. Few of those present knew, for example, that the room and board of men living on a dredge is regarded as part of their salary and must be included as such in their income-tax reports.

There was also some discussion of the proposed amendment to the law governing employers' liability under the longshoremen's act, Bill HR4986. The excessive penalties which would be imposed under this amendment were pointed out. It also developed that not all producers have been paying the federal unemployment tax for dredge employees because after paying this tax it was found that employees were unable to collect when out of work.

Also discussed was the effort being made by the U. S. Coast Guard to fingerprint and photograph all crews and waterfront employees who must carry identification cards in the future. A producer in the New England area said that this system has been in effect there

* [Separate ready-mixed-concrete meetings are reported in *The Concrete Manufacturer* section.—ED.]

The annual banquet of the National Sand and Gravel Association with the speakers' table in background.

Abe Goldberg, Allis-Chalmers Manufacturing Company; K. C. Saunders, C. & O. Railway Company; R. O. Peters and J. H. Evans, Sturm and Dillard Company.

for several months but others in other areas had heard nothing about it. It was announced that the Coast Guard will notify producers as soon as provisions are made for issuing such cards in various areas. Without such cards even occasional visitors will not be permitted on the dredges or other floating equipment or even on the waterfront.

In his annual report Stanton Walker, Director of Engineering, National Sand & Gravel Association, reviewed the work done by his department in the past year. He reported the progress that has been made on tests of various gravels from all parts of the country to determine their durability through freezing-and-thawing and other physical tests. The adhesion of bitumen to these different aggregates was also investigated. Mr. Walker discussed the chert problem.

In the bitumen test the resistance of various aggregates to stripping—the ability of an aggregate to retain its bitumen coating in the presence of water —was determined by coating a sample of the aggregate and curing it. The sample was then placed in water and well shaken. The amount of coating remaining was determined visually. The early results of these tests, said Mr. Walker, are distinctly encouraging. Tests were also made of several patented treatments designed to promote such adhesion.

Investigations are also under way to determine the relationship between the ability of a sand to resist freezing and thawing and its reaction to other soundness tests. According to Mr. Walker, sands from many sources are being tested.

An open forum on operating problems in the sand-and-gravel industry, held on Thursday morning, is reported on pages 55 and 56.

Problems arising from the application of the mine priorities order to the sand-and-gravel industry and those raised by the preference ratings applied to the ready-mixed-concrete industry were discussed by Dr. Wilbur A. Nelson, Administrator of the Mining Branch of the War Production Board at a sand-and-gravel session and by Dean C. Gallagher, of the Maintenance and Repair Section of the board at a ready-mixed-concrete session. The former is reported on pages 56 to 62, the latter on pages 105 to 108.

Operating problems of the ready-mixed-concrete industry and cold-weather concreting were discussed at a special afternoon session of the concrete association and are reported on pages 103 to 105.

At the annual banquet Walter D. Fuller, president of the Curtis Publishing Company, publisher of *The Saturday Evening Post, The Country Gentlemen, The Ladies' Home Journal,* and *Jack and Jill,* gave an address on the American way of life and the dangers to which it is exposed. It covered the points and presented the arguments that are characteristic of speeches delivered at gatherings of business men, and need not be summarized here.

At a joint session of the two organizations on Friday morning a summary of business conditions in the sand-and-gravel and ready-mixed-concrete industries was presented by Executive Secretary V. P. Ahearn, while the durability of concrete as affected by aggregates was discussed by Director of Engineering Stanton Walker. Both addresses are summarized on pages 52 and 53.

One of the most interesting sessions was that on Friday afternoon devoted to a discussion of labor relations in the two industries. As the talks were informal in character and "off the record" so far as reporting is concerned no report of them will be given. However, there was some discussion of the truck and tire situations by Mr. Ahearn.

The sand-and-gravel association's officers elected for 1942 follow: President, Otto S. Conrades (St. Louis, Missouri); vice-president, H. S. Davison (Pittsburgh, Pennsylvania); secretary-treasurer, Harris N. Snyder (Buffalo, New York). The executive committee consists of these officers and the following: T. E. Popplewell (Fort Worth, Texas), Robert Mitchell (Los Angeles, California), George W. Renwick (Chicago, Illinois), John M. Settle (Louisville, Kentucky), Stanton Walker, director of engineering, and V. P. Ahearn, executive secretary.

Members of the ready-mixed-concrete association elected the following men as their officers for 1942: President, H. F. G. Pelsue (Los Angeles, California); vice-presidents, Stephen Stepanian (Columbus, Ohio), Alexander Foster, Jr. (Philadelphia, Pennsylvania), and C. W. Shirey (Waterloo, Iowa); secretary, D. D. Reynolds (Boston, Massachusetts); treasurer, Alexander Johnson (Brooklyn, New York). These and the following men comprise the board of directors: Herbert F. Jahncke (New Orleans, Louisiana), H. F. Thomson (St. Louis, Missouri), J. L. Shiely (St. Paul, Minnesota), James F. McCracken

Frank M. Welch and C. E. Glander, new general sales manager of the American Aggregates Corporation.

(Louisville, Kentucky), Joseph H. Dixey (New York City), Stanton Walker, director of engineering, and V. P. Ahearn, executive secretary.

The Manufacturers' Division of the gravel association elected Irwin F. Deister (Deister Machine Company, Fort Wayne, Indiana) as chairman and the following men as vice-chairmen: Theodore Aulman (Eagle Iron Works, Des Moines, Iowa), E. J. Goes (Koehring Company, Milwaukee, Wisconsin), Abe Goldberg (Allis-Chalmers Manufacturing Company, Milwaukee,

Wisconsin), Perry Nagle (American Manganese Steel Division, American Brake Shoe & Foundry Company, Chicago Heights, Illinois), L. W. Shugg (General Electric Company, Schenectady, New York), and Frank B. Ungar (Ludlow-Saylor Wire Company, St. Louis, Missouri).

Review of Business Conditions

(Joint meeting, National Sand & Gravel Association and National Ready Mixed Concrete Association, Friday morning)

V. P. Ahearn, executive secretary of the National Sand & Gravel and National Ready-Mixed-Concrete Associations, presented his annual report on business conditions in those industries. This is based on reports sent in by producers from all parts of the country and on other information. Mr. Ahearn did not commit himself definitely on the total sand-and-gravel production in 1941 but said that commercial production was about 170,000,000 tons, a 30-per cent. increase over 1940. Non-commercial production probably dropped some.

He estimated that ready-mixed-concrete production in 1941 was about 15.-000,000 cubic yards, an increase of 35 per cent. over 1940. As no official information on such production is available, these estimates are based on information received from members of this association who produce from 75 to 80 per cent. of the total ready-mixed-concrete volume.

Mr. Ahearn predicted a substantial decline in business for 1942, perhaps as much as 35 per cent., for both industries. This decline is expected to begin about June or July, unless the military-construction program is recast on a much more extensive scale. Any decline, he warned, will affect some areas much more than others. The high rate of demand in some areas strained the productive capacity of existing plants and made necessary considerable expansion geared to an expanded market which in a few months may no longer exist.

The average cost of production, according to the speaker, probably reached the highest level in the history of the industries, due mainly to increased labor cost. Prices had been at extremely low levels for some years and most price increases during the past year only served to alleviate this condition and were not excess profits. Generally, he said, prices were firm in those areas where large jobs were sold but in other areas, where business represented an accumulation of small orders, prices were very low.

Mr. Ahearn went on to analyze the sources of demand in 1941. Military work and other construction directly related to it formed about 50 per cent. of the demand. About 40 per cent. was attributable to essential civilian construction, including railroads, public utilities, public facilities generally, and highways and streets. The demand for railway ballast was probably the greatest since 1929 and this particular market he expects to continue at a high level in 1942 and 1943. The new importance of railroad shipments may, however, bring on the much-feared shortage of freight cars.

According to Mr. Ahearn, the Supply Priorities and Allocations Board (SPAB) did not measurably reduce gravel and concrete demands last year except in a few areas, but he expects that this year its policy will have a very discouraging influence on demand. He advised producers to face the realities of the situation and to make their plans fit a drastic reduction. He said that there will be some military work and some essential civilian construction, but stressed the fact that purely private building, which requires the use of critical materials, is through for the duration. Defense housing projects, he said, will form an important part of the essential civilian construction. Federal-Aid highway construction will in 1942 again take on its former importance to the gravel industry.

According to Mr. Ahearn, these industries on the whole have done quite well in securing repair parts, replacements and operating supplies. Much of this, of course, was due to the high ratings obtained on military and other important construction. In 1942, he warned, project ratings will be largely a thing of the past and the procurement problem will become much more severe. The War Production Board is expected to follow a ruthless policy of giving exclusive consideration to military requirements and any operator expecting special consideration must present convincing evidence that he is entitled to it.

These industries, said Mr. Ahearn, are eligible for tires and tubes to cover production and distribution requirements but producers must put in bids for their requirements before the local quotas are exhausted or they may have trucks standing idle. He also advised that the greatest possible care of tires be taken as there is not as yet any evidence that the situation will improve for a year or two. Similar precautions were advised with respect to conveyor belting and rubber crusher parts. Company-owned automobiles. he said, are not eligible for tires and there are no prospects that they will be in 1942.

It seems quite evident that these two industries can not be converted to war production but in an emergency certain phases of them can be made useful. The machine-shop facilities can in some cases be made useful and trucks, tractors, towboats, barges and other equipment can be leased or sold to other users. In closing, Mr. Ahearn drew attention again to the fact that these industries face the toughest year in their existence and urged that every effort be made to maintain their iden-

L. C. Mosley, Marion Steam Shovel Company; Jay Estey, Estey Sand & Gravel Company; J. H. Law, Western Indiana Gravel Company; Louis G. Uhl, Marion Steam Shovel Company.

Among those from the Pacific Coast were: Howard Marsh, Graham Brothers, Inc.; Frank Gautier, Consolidated Rock Products Company; Lloyd C. Corser, Saticoy Rock Company; Walter Moore, Jr., Consolidated Rock Products Company.

tity as industries. He advised anticipation of power shortages in some sections, transportation priorities, labor shortages, equipment shortages, and other restrictions as yet unforeseen. He emphasized the fact that, while prospects are discouraging, these industries must be prepared to accept the responsibility of finding their place in the new war economy and their obligation to make any necessary sacrifice to help along our war effort.

Construction and Highways

(Joint meeting, National Sand & Gravel Association and National Ready Mixed Concrete Association, Wednesday afternoon and Thursday morning)

In discussing *Construction in 1942* Thomas S. Holden, president of the F. W. Dodge Corporation, said that construction is one of the key war industries. He pointed out that another important war industry, automobile manufacture, has been conscripted 100 per cent., while the construction industry seems to be conscripted about 80 per cent. for 1942, both for the same reason, a shortage of vital raw materials. Since Pearl Harbor all estimates of war-construction needs and total construction volume have been stepped up and it now seems evident that the total construction volume in 1942 will be approximately the same as last year. Further additions to the program are also possible.

The 1941 volume of contracts awarded, said Mr. Holden, was the largest since 1928 and represented a 50-per cent. increase over 1940. The most striking feature of the 1940 program was the volume of manufacturing building, which was nearly triple that of the preceding year and in 1941 it far exceeded that of any previous year. This paralleled an all-time high for industrial production. The volume of non-residential building other than industrial plants was 33 per cent. higher than in 1940 and residential building contracts were up 22 per cent. Heavy engineering contracts increased 56 per cent.

According to Mr. Holden, war construction falls into three general categories.

First come the requirements for the growing armed forces, including barracks, cantonments, air and Navy bases, fortifications, hospitals, recreation centers, access roads and strategic highways.

The second category includes facilities for producing, handling and storing munitions of war. Assembly plants and storage depots may be built by the Government in many parts of the world.

The third important class of war needs consists of housing for defense workers and the speaker predicted that this type of construction will increase considerably but not enough to make up for the decline in non-defense housing.

In spite of every effort to conserve metal in essential projects and to use substitutes wherever possible, this industry, said Mr. Holden, will use a great deal of metal in 1942. After peak of war construction is over, possibly late this year, increased allocations of metal for civilian construction may be made available. Civilian construction not rated as essential is now being limited to projects requiring only a small amount of metal but maintenance and repairs are expected to continue in normal volume.

The 1942 program, though large and offering full employment to most of the important groups that make up the construction industry, will involve considerable dislocation, according to Mr. Holden. Construction will be largely in defense areas and will force many of those employed to find employment away from home. Material producers and suppliers will fare variously, depending on their locations and the products sold. Producers of sand and gravel and ready-mixed-concrete are, he said, in a peculiarly fortunate position as they will have a large market and will probably have to change their customary procedures less than almost any other producers. He estimated that volume of production in these industries may reach or even exceed that of the last two record years.

According to Mr. Holden, the construction industry has been very well conditioned to meet its 1942 obligations as a war industry. Eight consecutive years of increasing volume have assured an adequate capacity and it has already made many adjustments to the system of priorities and allocations. The industry is accustomed to jumping from one type of construction to another and no period of retooling is necessary. He predicted an increase in the popularity of prefabricated houses at least for the duration.

When this war is won, said Mr. Holden, this country will be in a position of world leadership which will make it impossible to thrust aside world responsibility as was done after the last war. It will have the most magnificent productive plant of any nation in history. It will also have a debt burden which can be carried only if production and national income are maintained at much higher levels than any that have yet been reached. It was our failure to plan wisely for peace after the last war, according to Mr. Holden, that brought about the depression and helped to bring on this war. Wise preparations must be made to prevent a repetition and the first step is to control the boom which may follow this war. Big construction programs of public and private work are already being considered as the means of tiding over the period of necessary industrial and commercial readjustments. A large reserve of public-works projects is being built up and slum redevelopment will be important.

Mr. Holden heartily approved the appointment of Donald M. Nelson as chairman of the new War Production Board with full authority, adding that he knew of no man in this country better equipped to handle this responsibility. In closing he cautioned that the construction and related industries must realize that their activities will be al-

most completely determined by the war program.

In opening his discussion of the subject of *Highways During and After the War,* H. S. Fairbank, chief of the Division of Research, Planning and Information of the Public Roads Administration, Federal Works Agency, mentioned the foresightedness of the German Government in building a series of strategically located superhighways, or *autobahnen,* as an important part of the closely-integrated system of industrial production which has been so vital to its war effort. In this country, he said, the government has also been aware of the importance of highways to such an effort and this has been one of the main reasons for the Federal-aid system. Through this system the Government not only encouraged the states to build highways by paying part of the cost, but also exercised considerable control over the types and locations of highways to be built or improved. Over a period of two decades, he said, the system of highways that has been built up satisfactorily meets the needs of peace-time traffic but also meets, in a general way, the requirements of war.

Despite the general adequacy of our highway system, said Mr. Fairbank, it has been recognized for some years that in many details it remains inadequate. In order to correct this condition highway-planning surveys were instituted in 1935 and the information accumulated, together with that available from other sources, enabled the Federal Works Administrator a year ago to give a quick reply in specific terms to the President's request for recommendations concerning the highway improvements needed for service of the nation's defense needs. The importance of access roads to military and naval establishments and industrial plants making war materials was emphasized. Recommended as of secondary importance was the elimination of definite deficiencies in the 78,000-mile strategic-highway network. Federal appropriations were recommended for both these major objectives.

The occurrence of actual war has increased the necessity for access-road improvements, according to Mr. Fairbank, but has placed unavoidable restrictions on this work to insure their completion in the order of their importance. Federal highway funds, even unexpended balances of earlier Federal-aid allocations, will be used only for those roads shown to be of vital importance. Recent legislation authorizes Federal payment of 75 per cent. of the cost of construction and right-of-way for strategic network projects and up to 100 per cent. of the cost of access roads. No relaxation of such restrictions is expected for the duration of the war. Consequently Federal highway expenditures are expected to drop below the levels of recent years and the decline in Federal and state highway revenues will also have an effect. Shortages of critical materials required in highway construction—chiefly steel, zinc, and copper—will be another reason for curtailing highway construction.

Mr. Fairbank then explained in some detail what the Public Roads Administration has been doing to assure the availability of sufficient critical materials and essential equipment for the more vital highway improvements and for maintenance. He also explained the procedure which has been established for the rating of all proposed street and highway projects according to their importance. All applications for preference ratings for this type of work are to be forwarded to the War Production Board through the Public Roads Administration which receives them from the State highway departments. Final decisions rest with the Divisions of Priorities.

Mr. Fairbank also explained the importance to the WPB of knowing the total dimensions of the desirable street and highway program for 1942 with particular reference to the quantities of critical materials, labor, equipment, etc., involved. Such information, he said, is now rapidly being compiled. He also described some of the design and specification changes recently recommended by the Committee on Standards of the American Association of State Highway Officials, which call for the use of reinforced concrete in place of structural steel wherever possible in bridges, the substitution of small concrete box culverts or concrete or clay pipe for corrugated-iron pipes, and even the reduction or elimination of reinforcing steel in concrete pavements by increasing their thickness.

By citing the conditions at various large defense plants Mr. Fairbank demonstrated the importance of suitable highways to the war effort and stressed the fact that the maintenance of existing highways should under no circumstances be neglected. He predicted that, after the war there would be a reversal of present conditions with a surplus of materials and labor instead of the present shortages. The time will then be propitious for the fulfillment of the long-cherished ideal highway system. He mentioned the recently-appointed National Interregional Highway Committee as a step in the direction of a future program of highway modernization. Mr. Fairbank then went into considerable detail in describing the objectives of such a program and the difficulties which will confront it. Such a program requires long-range planning and will keep the affected industries busy for years to come. He also mentioned the $10,000,000 appropriated by the Defense Highway Act of 1940 to finance such planning, this money to be matched equally with state money.

Irwin F. Deister, Deister Machine Company, new chairman of the Manufacturers' Division.

Construction in the War Emergency was the subject of a paper by James D. Marshall, assistant managing director of the Associated General Contractors of America, Inc. Three problems confronting us, he said, are fitting the right men into the right places, keeping private enterprise going, and keeping private enterprise in a condition to carry on after the war is over. He also said that the construction and aggregates industries could be proud of the fact that they have met every schedule that has yet been imposed upon them. In explaining the letting of Government contracts he said that competitive bidding is used wherever possible but negotiations are made where necessary. Fixed-fee contracts are used only where the other two methods are not possible.

The shrinkage of construction volume, said Mr. Marshall, is and will be compensated for to some extent by the fact that some contractors are going in for shipbuilding and other related activities. Construction workers on defense plants are, he said, in many cases going into the plants when they are completed, thus absorbing some of the excess labor which might otherwise become a problem.

In the absence of Bernard E. Gray, chief engineer of the Asphalt Institute, his paper on *The Field for Sand and Gravel in Bituminous Road Construction* was read by A. H. Hinkle, a district engineer for the Institute and a former Indiana State Highway Department engineer. Mr. Gray emphasized the importance of the "engineered foundation," as no good surface can ever make up for a bad foundation. Experience has shown that, where proper attention is paid to this item,

maintenance is greatly reduced and the cost of the initial surface can be lowered as contrasted with the effort to make an extra-heavy pavement take the place of a sound foundation. He discussed the various types of subgrades now in use, saying that stabilized soil is only justified where aggregates are not available within a reasonable distance. Where aggregates are plentiful, he said, it is often more economical to increase the aggregate thickness and to omit any treatment, the important detail being the control of density.

It is in this type of base, said Mr. Gray, that the future business of the commercial pit lies, because the accurately-graded gravel necessary for a sound base can not be obtained from wayside pits. In the accompanying table he gives four gradations, one of which will fit the product from practically any commercial pit.

Mr. Gray said that by utilizing the gradation afforded by commercial pit operations foundations of 8- to 12-inch thickness can be made and that these are of the highest supporting value, are economical, and are practically immune to variable weather conditions. The only requirement is consolidation to a satisfactory density and this can be effected by either of two methods. One is by suitable mixed-in-place methods of blending the several sizes of aggregate to produce a uniform dense condition. Where weather conditions are not favorable, pre-mixing of the aggregates and water may be the desirable method. Mr. Gray said that such premixing can be done in transit-mixers as well as in all types of drum and pug-mixers. The possibility of using portable plants to provide suitable aggregates when a stationary plant is not available was suggested.

Mr. Gray mentioned the fact that the Asphalt Institute has just finished a revision of its construction specifications. For surface courses 40 per cent. is used as a measure of durability. The stability of a mixture is determined by its resistance to shear. Definite aggregate gradations are used as measures of uniformity. Experience has proved, he said, that good-quality gravels have no difficulty in meeting such specifications. For surface courses 0 per cent. wear has been specified and 50 per cent. for base courses. The new specifications will be written on the basis of Simplified Practice Recommendation R163-39 in respect to all sizes of aggregates in so far as it is possible to do so. Tables of requirements for several types of construction were presented.

In closing Mr. Gray said:

"I have endeavored in this paper to point out what seems to me a great opportunity for the producers of sand and gravel. The growing appreciation of the fact that heavy pavements will not make up for bad foundations has come at a time when great rapidity of construction is required under any and all weather conditions and when transportation must be kept to the minimum. The sand-and-gravel producer is in a position to deliver, within relatively short distances, processed materials of the proper gradation which can be combined into foundations of substantial thickness at costs which are economical, and which will employ the full output of the pit.

"An asphalt pavement placed upon such a foundation furnishes the required resistance to abrasion and the waterproofing needed to protect the "engineered" foundation and likewise involves the minimum use of transportation. The composite cost of an 8- to 12-inch gravel foundation and a 4-inch hot-mix asphaltic concrete surface, using from 12- to 16-inch depth of aggregates is less than for any other possible pavement of equal supporting power. The engineering merit of such a design is apparent and I am certain that within the very near future such designs will become the standard method of construction on all highways and airports throughout the country."

PERCENTAGE BY WEIGHT PASSING SQUARE-MESH SIEVES
(A.A.S.H.O.T.—27)

Sieve Designation	Grading A-2	Grading B-2	Grading C-2	Grading D-2
3-inch	100			
2-inch	65—100	100		
1 1/2-inch		70—100	100	
1-inch	45—75	55—85	70—100	100
3/4-inch		50—80	60—90	70—100
3/8-inch	30—60	40—70	45—75	50—80
No. 4	25—50	30—60	30—60	35—65
No. 10	20—40	20—50	20—50	25—50
No. 40	10—25	10—30	10—30	15—30
No. 200	3—10	5—15	5—15	5—15

Edwin P. May, and Wm. P. McCutcheon, Union Sand & Gravel Company; Bradley S. Carr, American Manganese Steel Division.

Forum on Operating Problems

(National Sand & Gravel Association, Thursday morning)

The open forum on sand-and-gravel operating problems was as usual one of the most popular meetings of the convention and the subjects covered aroused much interesting discussion. This exchange of views was based on subjects selected as the result of a questionnaire concerning recent technological advances relating to sand-and-gravel production which was sent to a representative group of the membership early in November with the request that the subjects outlined be discussed. The answers received were used to guide the discussion at this meeting.

The subject of classification problems in the retention of existing fines brought out the fact that there is a trend toward the specification of from 10 to 15 per cent. through 50-mesh and 2 to 4 per cent. through 100-mesh. Some specifications are also reported to be setting a limit of not more than 8 to 12 per cent. through 100-mesh. It was brought out that to meet this problem natural fine sand was added wherever it was obtainable. Where no such materials exist the necessary fines were obtained by crushing. One producer found that adding natural fines had no effect on the strength of concrete while the addition of crushed fines increased its strength. Another reported that natural fines made a more workable concrete but that some clay was saved along with the extreme fines resulting in a lower strength. A number of producers are reducing pea gravel which was formerly wasted.

According to Stanton Walker, the trend toward the demand for additional fines is being overdone in some areas and such specifications may be relaxed in the future. Various means used by producers to meet this problem were described. One producer found that the removal of some of the middle sizes in his sand made it acceptable. Others reclaimed sand from old waste piles and blended it with the regular product or installed large settling basins after their classifiers. This, it was pointed out, can only be done where the sand

is exceptionally clean. Some pulverized their gravel to get the fines and one purchases fine sand from another source. Several of those present advised the division of sand into fractions which are then recombined to meet the specifications. Blending from storage on a belt-conveyor was the favored method, but some have successfully done the blending in loading cars with a crane.

Irving Warner (Warner Company, Philadelphia) described the methods followed by his company in retaining the extreme fines. A settling area of 7 square feet must be provided for each 100 gallons of water used per minute in order to retain minus 100-mesh material. For material under 100-mesh in size four times the area is required. Mr. Warner also laid stress on the fact that there must be no turbulence in the water flowing through the settling tank or basin. He advised producers to test their overflow waste water regularly to see what they are losing.

In the discussion of broadened markets for sand and gravel bituminous pavement construction came in for special attention. One producer described a job for which he supplied a graded mixture of sand and gravel for a base course. This material was mixed in a pug-mill with 2 to 3 sacks of cement and enough water to make it workable. This mixture was then rolled in place and topped with a bituminous surface course.

The consensus of opinion of those present was that there is a distinct trend toward the requirement that a crushed particle must have at least two fractured faces and in some cases all faces must be fractured. Apparently all specifications now call for at least 90 per cent. crushed material. It was mentioned that some specifications for concrete aggregates now limit the percentage of crushed material in order to insure the workability of a mixture.

The subject of soft stone elimination as usual came in for attention but no definite conclusions were reached other than that no one method is best for all deposits. Various producers described the methods used in their plants which included scrubbers loaded with steel balls, impact crushers, etc. One described a vibrating conveyor which causes the lighter soft stone to come to the top as it travels the length of the conveyor. At the discharge end of the conveyor a jet of water is used to separate these materials.

The trends in grading specifications for gravel were also discussed. The growing practice of limiting the amount of pea gravel, according to Stanton Walker, will benefit producers in some areas. A producer commented on the fact that his plant serves three states and that only one of these states has adopted simplified practice, complicating his problems.

Some of the trends in the methods of operation and equipment were also commented on. Among these is the growing use of vibrating screens, scrubbers, and screen plate. The growing popularity of trucks and scraper wagons for pit haulage and overburden removal was also commented on. Producers were advised to exercise greater care in adding water in their plants as its effect on sand classification should be considered.

Mine Priorities Order P-56

DR. WILBUR A. NELSON, Administrator of Mine Priorities, W.P.B.

(National Sand & Gravel Association, Thursday afternoon)

(As Dr. Nelson's address at the National Crushed Stone Association convention on the following Monday was, in effect, a duplicate of this one it will not be separately reported and this summary will serve for both.—EDITOR.)

"In the recent reorganization [of OPM] there has been no change in the authority or position of the Mining Branch which handles priorities in which your industry is interested. We report to the Materials Division, which in turn reports to the present War Production Board.

"The Mining Section has nothing to do with anything in regard to prices connected with any phase of the mining industry. I mention that because very often, particularly when addressing metal miners, they want to know why we have fixed certain prices. We didn't fix them. We had nothing to do with it.

"We administer in the Mining Section, or the Mining Branch as it is now called, three priority orders. Two of those orders are of interest to this group. The first order is known as the Mining Order and has the number P-56. It covers priority assistance on everything needed in any type of mine, and we so classify sand-and-gravel [as well as crushed-stone] operations after they have received a certificate bearing a serial number which can only be given through our Washington office.

"In each state in the Union we asked the Governor to designate one of his state officials as an Emergency Coördinator of Mines. Such an official, after he was designated, was asked by Donald Nelson to serve in that capacity as a clearing-house for that state. This particular coördinator in each state furnishes us with a list of mines or mining operations which he feels should receive serial numbers, and we then, after checking those lists, give serial numbers to those operations on the basis of the amount of material produced, the type of material produced, the number of men employed, and how they enter into the war picture; in other words, what defense contracts do they have, and for how long?

"After a mine has a serial number, that mine operator participates in the priority benefits given under Order P-56 . . . as follows: We have four stabilized ratings. The first is an A-1-a rating for any item needed to replace an item which has broken and which has resulted in a total or partial shutdown of the plant. In order to receive an A-1-a rating, you must either write or wire our office in Washington, giving us certain pertinent facts in regard to your breakdown. In other words, you must justify your request for an A-1-a rating. If possible, you should give us the number of your order on your supplier for the item which you wish to get.

"When such a breakdown is proved —which we can generally do within 24 hours, if you furnish us the proper information—we then send a wire that bears Donald Nelson's signature to you giving you an A-1-a rating on the company from whom you will get your particular item, and we notify the company also of this rating. In this way we have been able to avert numerous breakdowns in many important mining enterprises in the United States.

"We also have what is known as an emergency inventory rating which carries a rating of A-1-c. If you anticipate a breakdown and have no repair part to be used when a particular part breaks, you can order for emergency inventory or anticipated breakdown such parts on an A-1-c rating by writing or wiring us of that need, giving us all pertinent facts, and if they are substantiated—as they generally are—you will get a wire authorizing you to use that A-1-c rating.

"You will note that in these two cases we handle practically everything by wire, because we consider that it is the type of emergency that needs quick action. But if you want to get a new machine or new equipment, we generally handle new machines and new equipment by letter correspondence. It is necessary under Order P-56 for any mine operator who wishes to purchase new machinery or equipment, if it is listed in Schedule A attached to this order,[1] to receive the approval

[1] [See PIT AND QUARRY, January 1942, pp. 63, 114-116.—ED.]

V. P. Ahearn, executive secretary of the association, and J. M. Settle, Ohio River Sand Company.

of the Mining Branch and get an A-3 rating for the purchase of that new machinery or equipment before he can complete the transaction. . . . We do not have enough machines made of critical material to go around, and we have got to see that, with that limited mining-machinery capacity, the machines available go where they will produce the most of the materials essential for winning the war.

"This A-3 rating which you extend to your maker of mining machinery or your supplier of mining machinery can be extended by him to his supplier for any material he may need to make the machine or the equipment. He extends the A-3 as an A-3. Furthermore, if you wish repair parts for any machines listed in Schedule A—and I might say that if there is any mining machine that is not listed in Schedule A, we don't know what it is; we think we have covered the ground rather thoroughly—you use your serial number and stamp on your order the clause saying that you are using an A-3 rating under serial No. so-and-so, and order that repair part just as you would order anything from your supplier. That does not have to come through Washington. Your supplier can then extend that A-3 rating to his supplier, if he has to in order to get the parts.

"Finally, we have an A-8 rating for any supplies or items that a mine wants to buy or has to buy on a rating, if they perchance are not listed in Schedule A. There are very few things that come under this final A-8 rating to-day.

"That is the priority picture as it is built up in Mining Order P-56 to give priority relief to those people having serial numbers as mine operators under this order.

"Before the end of last year we also took over the administration of an order known as the Mining Machinery Order. This Mining Machinery Order was formerly known as Order P-23; it is to-day known as P-56-a.[2] P-56-a took the place of P-23 on the last day of last year. Those makers of mining machinery having a certificate number under old P-23 have only to apply again, giving information on inventory requirements, and their anticipated needs by quarters, to have given to them again the same serial number which they had under the old P-23. Of course, you must justify the fact that you have to anticipate your demands for raw materials.

"We have given about 60 of the mining-machinery firms their numbers over again under P-56 a. There are still about 60 firms which operated under the old P-23 which have not yet asked to receive the benefits of the new Mining Machinery Order. . . .

"We have a very serious problem in the making of mining machinery, in that the people who serve your industry have plants that are ideally suited for the making of munitions on one side and machine tools on the other. They are people having machinery and plants where the best type of precision work can be done. . . . Our makers of mining machinery can get an A-1-a rating for making all the machine tools that they will take, and their machinery is suitable for making machine tools. They can also get all the A-1-a ratings they want from the Army or Navy or munitions contractors, and all that we can give them to-day for making mining machinery is an A-3 rating, so they are being squeezed on both sides. We hope to be able to get a revision from the top side in the War Production Board which will place the makers of mining machinery on a parity with the makers of munitions, because the making of mining machinery is just as important as the making of munitions.

"We also hope to have it arranged so that the output of a plant making mining machinery will be 'frozen' at a certain capacity of the output of that plant for mining machinery, so that they can not have that capacity taken away from them for the making of munitions.[3] If we can succeed in those two things . . . we will then be able to say to everyone engaged in mining: We will give you the machines you need to get out what is needed for the war effort. We can't say that to-day. A study of the demands of each phase of mining for the year 1942, as far as we have carried that study, indicates that we will need between 15 and 20 per cent. more mining machines in 1942 than we needed in 1941. When it comes to repair parts, I can't tell you what the increase will be. From a graph standpoint, the line just seems to go up vertically, because when you start operating machines seven days a week, and on three shifts, the repair parts you need increase tremendously. But it is the job of our branch to see that these machines are made by the mining-machinery companies, and that they make repair parts for existing machines.

"This whole picture is further complicated by the fact that the mining machinery makers of the United States are to-day being called upon to furnish mining machines and repair parts for such machines to mines in Canada, Central and South America, in Africa and Asia, and we have to know from now on just where each machine goes, and whether it goes into a mine where it does the maximum good from the standpoint of our war efforts. . . .

"The nonmetallic industries will probably be the next group that will have to look forward to some restrictions. How we will take care of the needs of your particular group as things become more and more stringent, is something that I can not answer, but your secretary made a suggestion that might be the solution to this matter—that you would pick certain plants in certain areas. We have not reached that point yet, but I would be derelict in my duty if I did not say to you that I think you will have to look forward to the time when it will be harder and harder for you to get new equipment,

Arthur D. Lewis, Elmer F. Brooks and Otto S. Conrades, St. Louis Material & Supply Company; and O. E. Thaleg, Traylor Engineering & Manufacturing Company.

and perhaps harder to get repair parts for existing equipment; and I think I can say this truthfully, that in asking for new machinery, you will have to build a rather complete picture. You can not just state that you have 100 per cent. defense orders. I think you would have to show that the capacity of your plant, or the larger part of the capacity of your plant, was signed up for defense orders for at least a year, if you expect to go up into the thousands of dollars in getting new equipment. because it was true after the last World War, and I believe it will be true after this, that many people got large items

[2] [See PIT AND QUARRY, February 1942, pp. 29-30.—ED.]

[3] [This has since been done, Dr. Nelson reported at the crushed-stone convention. —ED.]

of equipment for contracts which lasted three or four or five months, contracts of a war nature, and when they had finished those contracts they had more capacity in their plants than they could sell. We hope that we will not get overexpanded in that way during the present war.

"There is only one way that we can solve your difficulties, and that is by 100-per cent. coöperation between your organization and our Mining Branch. In all the work we have done with the coal miners, in all the work we have done with the metal miners, and the work we have done with most of the large makers of machinery, we have discussed their problems day after day with them in Washington, and we have reached no decision until it was a decision which the whole group felt was the best for that particular phase of the industry. And you can rest assured that anything that has to be done, as far as sand and gravel or aggregates are concerned, will be done in the same way, and only after thorough consultation with representatives of your group that we can get in contact with through your national offices in Washington."

These questions and answers followed Dr. Nelson's presentation.

Q.—"In these anticipatory orders does one have to submit inventory, and so on, with reference to those, anticipating a breakdown? He may have some parts on hand; all of us usually do have some things. However, do we have to go in and substantiate an order before we convince you?"

A.—"I don't think you can anticipate a breakdown before you build a plant. I think that would be going too far the other way. I don't think you can anticipate a breakdown six months in advance, but I do think you can consider that you are anticipating a breakdown if you have no repair parts on hand for a part that you know has a life of only a month or two weeks in advance of the date of your request."

Q.—"Things like sprockets and cables, and that sort of thing, may have a six months' life; they may have a three or four-year life."

A.—"If you have a cable that has a six months' life and you find out it is going to take you six months to get that order through on an A-3 rating, you can order it on an A-3 rating as a repair. But if you find out that your cable has a three weeks' life and that you can't get a new cable except as emergency inventory, then we would give it to you on an A-1-c, and you can generally prove very easily what is the life of a cable in any operation."

Q.—"You mentioned buying a new machine outright under certain circumstances. Would that same thing hold true in that situation?"

A.—"If you want to buy a new machine, you must write to our office and get the approval for the purchase of that machine on an A-3 rating. You should tell us whom you contemplate purchasing it from, and what delivery they think they can give you on it, because if you can't purchase it and can't get the delivery you want, there is no need to bother us with seeing whether you can get it. You might write us and say you want approval for a new machine, and then write to the manufacturers and they say, 'We can give you 1943 delivery on it,' and that wouldn't do you any good."

Q.—"An A-3 is the best available on that?"

A.—"To date it is. We hope we can have a better situation to report to you later on."

Q.—"We have had it happen that a rock would get caught in some of the pulleys or some place and rip a conveyor belt from one end to the other before the operator would notice it and stop it. Could we use the A-3 rating in order to get a new belt to have on hand?"

A.—"I don't think you could order a new belt on the chance that a rock is going to slit the belt which you already have in your plant, provided your belt isn't worn. But if your belt has been in use for so many months and has reached such a stage of wear and tear that the rubber people can say to you, 'The ordinary life of that belt is just a month or two,' that is a different proposition. But if you have a brand new belt and just want to have a spare ready if some accident happens to that belt, my answer would be 'No.'

"As far as the rubber situation is concerned, we have a very serious situation. Beginning on the first of February no one can use crude rubber in manufacturing any rubber article that goes into any mining machinery. You can use crude rubber for manufacturing articles on war orders, and for a certain list of other articles in this order on Schedule A; and in that list, it might interest you to know, are rubber nipples; but you can't use rubber for mining machinery.[4] We hope to get that changed by an amendment before the first of February, but there are many of those restrictive orders and we spend about half of our time trying to get amendments to these restrictive orders to permit the makers of mining machinery to continue to operate."

Jesse A. Shearer, Indiana Gravel Company; W. E. Schaffnit, Stedman's Foundry and Machine Works; M. H. Moore, Indiana Gravel Company.

Q.—"Where one or more producers have been excluded in the issuance of mine serial numbers, what is necessary for those producers to do in order to obtain the same privilege as those who have obtained a number?"

A.—"Where a person has applied for a serial number and that number has not been granted, it is generally due to the fact that he is producing only a small amount of the particular material he is engaged in mining, and that it is felt that a small producer can get the priority assistance he needs under Order P-100 with an A-10 rating, because a very small producer does not, as a rule, have a mechanical operation of the sort that needs a higher preference rating. If he can not get the assistance he needs under P-100, he can file individual PD-1's with us for any specific item that he needs in order to continue his operation."

Q.—"Then you would recommend to those producers the use of P-100, with

[4] [See, however, below the last paragraph of this report.—Ed.]

the A-10, and upon their inability to obtain their desires, they should then apply on PD-1?

A.—"Yes we have priority ratings for the mining industry, and if we spread that rating over everything, irrespective of its importance, it would lose its value to the people who are really producing the major amount of our minerals and metals."

Q.—"Is it possible for one company with several operations to get one mine serial number to cover all operations?"

A.—"It depends on where the mines are located and their relationship one to the other. We will take, for instance, half a dozen bauxite mines located around the town of Bauxite, Arkansas. In this case we are letting them all operate under one number because they all are owned by the same company and all are located within a fraction of a mile of each other.

"If you have two or three sand-and-gravel pits that are all within a few miles of each other, and all tributary to one station or one post-office, it is probable we could allow them to operate under one serial number; but if they are in different counties and owned by the same company, the answer is 'No.' They will have to have other numbers, just as if they were in different states, when they would naturally have to have different numbers."

Q.—"Some members of this and allied industries operate portable plants. Under what circumstances may mine serial numbers be issued to cover such plants?"

A. (by E. W. Bauman)[5]—"It has been the practice in the office to consider portable plants, because of the nature of the operation, under the classification of minor operations. By that I mean the equipment involved is of such a nature that they can successfully operate under P-100 and, for application for new equipment, PD-1. It is not the intent that any legitimate or qualified operator should be thrown out of the so-called coverage of the order, but, as has been indicated, in order that we don't spread ourselves too thin, we would like to reserve P-56 for the more important operations."

Q.—"One of the most recent notices we received was to the effeect that if the mine-serial holder failed to respond on PD-19, whether he made a purchase or not, he was subject to have his mine serial number withdrawn. Previous to that time there was no notice that the holder had to file the report, even though he made no purchase. Is it necessary to make out that monthly report form if no purchase has been made?"

A. (by Mr. Bauman).—"The form you mention is PD-119. The order provides that the form be mailed monthly, not later than the tenth of the month for supplies obtained during the preceding month. If no supplies are received, it is still necessary that the operator file the report with his State Mine Coördinator, indicating that no supplies were obtained. The purpose of that is to keep alive the contact of the operator with P-56."

A. (by Dr. Nelson).—"I might say further that we felt that was very necessary after we had checked in with certain of our state coördinators, and in some states found that 50 per cent. of the people having serial numbers had not filed any returns. We knew very well that some of those people were buying supplies, and it gives us a better check on who is not complying, if everyone must make a monthly return. It is very simple if you have bought nothing to type that up and say 'No purchase.'"

Q.—Do we file that for orders or for receipts?"

A. (by Dr. Nelson).—"For material you have received."

A. (by Mr. Bauman).—"We are often requested to furnish forty or fifty copies of PD-119. The form developed in our branch is primarily an instruction sheet, indicating to you the manner in which the report should be made, and once we furnish you a sample, or this instruction sheet, it is intended that you make the copies necessary for your reports. If you will reproduce the copy furnished you for your reporting requirements you will not need to request that our office supply you with copies of the form."

Q.—"It is a common practice in the industry to have a single machine-shop to service several operations. This shop may be located at one of the operations or may be removed entirely from an actual site of production. It is assumed that this situation is no bar to the use of P-56 in the procurement of supplies for the machine-shop, since a machine-shop is obviously necessary to continuity of production."

Ralph S. Hunt, Screen Equipment Company; Leon Breeck, Carrollton Coal & Sand Company; S. H. Saunders, W. F. Saunders & Sons.

A. (by Dr. Nelson).—"If that machine-shop is owned by one of the companies and several other companies wish to use it, it seems to me that the serial number of any company wishing to use it can be used on an order on that machine-shop for repair parts or for any machine they want to make for any mine, and that can be done on an A-3 and the machine-shop can extend that A-3 to its supplier for any material it needs to make the repair parts for any machine."

Q.—"A truck contractor approached our company for the purpose of getting an extension of our P-56 order to secure the delivery of two new trucks. I told him I didn't know whether our order would permit that or not, but he has two trucks that are being held for delivery, subject to some type of order or priority rating, and he wanted to know whether we could so extend our P-56 that he could secure the delivery of these two trucks."

A. (by Mr. Bauman).—"In the first place, assuming now that the truck 'freezing' order hadn't been put into effect, that would constitute a request for new equipment, and the normal procedure would have been to apply to the Washington office for permission to extend a rating for the new equipment on the truck. Now, however, since the truck 'freezing' order is in effect, if we were to give you a rating under P-56, it wouldn't permit the dealer to deliver the truck. We have been working with the Transportation Branch in an attempt to secure remedial measures to provide for the mine operators their requirements for trucks in emergency cases.

"Recently, in some instances where the mine operator has had trucks on order from his supplier or manufacturer, the equipment is on hand ready for delivery, they have arranged for a release to the operator of those trucks. So, in direct reply to your question, if the trucks were ordered some time ago and are now ready for delivery to you at the distributor's point, if you will cite to us the circumstances, furnishing the information as to why you need the equipment, the fact that the trucks are ready for distribution, that the order was placed some time ago, I shall take the request to the Automotive Branch and, if the circumstances warrant it, quite likely a release will be made for delivery of the trucks."

Q.—"Let's look at the holder of a mine serial number who is also operating ready-mixed-concrete trucks. His mixing unit has gone bad; there is need for a new mixing unit to be mounted on the chassis. What is to be done under the circumstances?"

A. (by Mr. Bauman).—"P-56 is in-

[5] [Technical Adviser on Nonmetallics to Dr. Nelson.—Ed.]

tended for mine operations. We differentiate between mining operations and shipping, or the end-use after the material is mined, or in some instances we call it the beneficiation stage. Now ready-mixed or transit-mixed concrete does not come under Order P-56, and the relief for repairs would be P-100, or, in the case of new equipment, PD-1, which will be PD-1-a in February.

"The request for trucks by mine operators under P-56 should be made only in case the trucks are used in the mine for hauling raw materials. By a survey of your industry, and also the stone industry and the slag industry—the aggregate industries as such—you will find that about 60 per cent. of your haulage in the mine is done by trucks. It is that type of truck operation that P-56 covers. But hauling of your finished product, be it from the plant to your distributor, or ready-mixed concrete, is just outside the scope of P-56."

Q.—"What is the oulook for manganese for use in crushing equipment?"

A. (by Mr. Bauman).—"To give you a short, terse answer, the outlook is bad. However, as was indicated by Dr. Nelson, we are cognizant of the need for alloys in the mining industry, and it is in good hands for being attended to in attempting to secure for you the requirements to continue the essential operations."

Q.—"Truck-mixing is another step in the economic process, it gets a little beyond our sphere. A great many of our sales, however, are made delivered. I had assumed heretofore that delivery of our product would be within the coverage of P-56, where there is no conversion, no further processing, but merely delivery of our product to the customer. Is that correct, or not?"

A. (by Mr. Bauman).—"Hauling your finished product is considered on the side of packaging, and the operations for the sand-and-gravel industry covered by P-56 are the operations up to the packaging stage; so that if you have been using the order for obtaining repair parts on trucks that haul your finished and processed material, you have been doing something, obviously innocently, that you were not entitled to do under the order."

Q.—"Let's assume that you have issued the privilege of using an A-1-a priority for a breakdown. Just how much competition is our A-1-a going to have with the large amount of A-1-a business that these firms have?"

A. (by Mr. Bauman).—"If you have a rating of A-1-a, you enter it with your supplier, and if he already has on hand some A-1-a ratings then your rating takes its place in line with equal ratings. However, if he has ratings lower than A-1-a and you place your A-1-a rating, then, according to the regulation, and with provisions of time, and so forth, your request or your order will be given consideration accordingly.

E. J. Nunan, Buffalo Slag Company; J. M. Thistlewaite and A. E. Owen, Nordberg Manufacturing Company; H. N. Snyder and H. W. Vickery, Buffalo Slag Company.

"We have had no complaints about delivery of equipment on which ratings have been issued from the office on an A-1-a or A-1-c, and after consideration of requests for new equipment there have been few complaints directed to our office where delivery wasn't made on the basis of an A-3 for the new equipment."

Q.—"Supposing you have a mine that has an order to deliver to a defense project, and the operator mines his material and then has to deliver it by means of transportation facilities to its destination. Would he use P-100 for the transportation, and would that bottleneck the operation?"

A. (by Mr. Bauman).—"I know of no specific instances to which I can refer, so I can't say that that has existed. I would imagine possibly that it might. However, if a defense project is important enough, it already carries a high rating, and with the manner in which ratings have been issued from these important defense projects, I doubt whether it would be difficult for the operator to secure a rating sufficiently high for him to get new trucks, as well as repairs. That would be the procedure to follow, to apply for a rating on the project."

A. (by Dr. Nelson).—"Your project rating for any government project would probably be higher than the rating you had under your mine order, so I don't see how there could be a bottleneck."

Q.—"Our plant is delivering 500 or 600 tons a day to a military project. Those trucks are hauling for us under contract. Sometimes their owners came to us to get an extension for this little help or that little help, and we gave it to them—evidently wrongly, from what you say—and then sometimes they went to the prime contractor or to this air field and got an extension of their rating; but we have both been helping them do the things that were necessary to do."

A. (by Mr. Bauman).—"Our attitude in administering the order is not with the idea in mind that the gravel operator was made to fit Order P-56. We realize that Order P-56 was designed and set up not to serve the needs of the sand-and-gravel industry, not for your case in which you are interested, but for the mine operators in general. We realized there were some instances in which possibly the wording is not flexible enough to cover your specific instance, but if you do within reason what you think is the right thing to do, coöperating with the intent of the order, you will be all right. And we all know what the purpose of the order is. Our office is available by telephone or wire or personal contact, and if you have questions, refer them to us and we will be glad to give you the answer.

Q.—"Where is your office?"

A. (by Mr. Bauman).—"In Wing 1, floor 1, Temporary Building E. That is at Sixth and Adams Drive, S. W., Washington, D. C."

Q.—"Under A-3 is there any marked distinction between replacement of a machine and expansion, having in mind, let's say, a crusher that I wish to replace—an additional new crusher to enlarge the plant?"

A. (by Mr. Bauman).—"The purpose of the order is to control the distribution of equipment as such, so that, whether equipment is necessary for replacement or for expansion, it is still necessary that requests be made to the office in Washington for a rating on

the purchase of that equipment. Now the consideration given your request, as regards the difference between equipment for expansion or for replacement, will quite likely weigh heavily in the decision as to whether a rating will be issued. Unless you can justify your plans for expansion as related very directly or closely to defense activities—and we don't mean defense activities in the broad term of defense activities—unless it can be shown that it is essential for, let us say, the furtherance of defense work, in view of the tight situation with regard to equipment now, we would be reluctant to grant ratings for equipment intended for expansion."

Q.—"We have a small plant adjoining our own plant that does not have a mine serial number under P-56. When we have a peak load, we have to call on them for deliveries. Is it possible for us to buy for them repair parts, as it were for our own use, under P-56?"

A. (by Mr. Bauman).—"Unless they are supplying you with raw material, you have no authority to extend assistance in supplying them with equipment or repair parts under the ratings you obtained under P-56."

Q.—"They are supplying us with finished material that is to be delivered on a defense project. The question came up and I had them secure their priority from the general contractor, but I thought that we would be permitted to extend P-56 for that purpose."

A. (by Mr. Bauman).—"No; if they are qualified to come under the order, they, themselves, assume the responsibilities that the number itself implies when you accept it. If not, then as previously stated, they use the P-100 or PD-1 for new equipment."

Q.—"Many mine operators have no railroad facilities for delivering material. Therefore, P-56 is of no particular value to them unless they have a means of delivering that material. Therefore, you can readily see how quickly they could be closed down or put out of the picture without using P-56 or some other method better than P-100 to get his product away from his plant, inasmuch as they do not have rail facilities or transportation."

A.—(by Mr. Bauman).—"We are sympathetic with that type of operation and realize that for the continued operation of such a plant, there must be some form of relief for its trucking facilities. However, as of to-day, the order will not permit us to extend coverage of P-56 for its requirements.

"Now under the General Transportation Order, which is intended to take care of trackage or general rolling stock, railroads that serve the plants enjoy a rating; I think I am correct when I say it is A-10. I realize that an A-10 for fishplates, track supplies, and the like, may make it easier to obtain the supplies than an A-10 for truck repairs, but none the less, that is the provision as of to-day.

"If the sand-and-gravel plants are of sufficient magnitude, and that type of operation is effective, we will be glad to have you direct to our attention the conditions and see what can be done."

Q.—"If a complete plant is required for a defense project, and this project only lasts about one year, could we receive priorities for all the equipment required for that plant, including belt-conveyors, drag-lines, and everything that it would take to build the plant?"

A. (by Mr. Bauman).—"The answer to that question is this: Until a plant is built and in operation, of course it is not possible to assign a serial number to it. Therefore, you are not a mine operator under P-56. So anyone contemplating the erection or construction of a new plant must make application for a project rating to the Priorities Section, with the full facts submitted, and if a rating is issued on the projected plant, then all the equipment necessary for the operation of that plant would be included and given the rating assigned. In other words, if you made application for a project rating of a new plant and, after having received the review of the branches involved it was assigned a rating of A-2 or A-3, then all the equipment involved or necessary for the construction of that plant would have a rating of A-3, regardless of its duration. The fact that it might be in existence only six months or one year would be considered when the rating is issued.

Q.—"On your report forms, you have four headings: A-8, A-1-a, A-1-c, and A-3. Shouldn't there be two A-3 headings for reporting?"

A. (by Mr. Bauman). — "Yes. When the report was made out, an error was made in the fact that A-3 was not subdivided. It should be A-3 for repairs and A-3 for new equipment. All your supplies obtained under the order should be identified with regard to the order under which they were obtained when you report on a PD-119."

Q.—"If you have an existing plant that has a mine serial number and want to rebuild this plant and it will require quite a little bit of new material in the reconstruction, can you use your A-3 rating on that?"

A. (by Mr. Bauman).—"Particularly in the last few months operators have wished to expand their operations for various reasons, but in the event it involves a considerable quantity of new equipment, it is necessary that an application be made for a project rating. Order P-56 is intended to provide repair parts to maintain present operations or to provide new equipment for continued and expanded operation when the expansion is warranted, or if the expansion does not involve too much new equipment. But where a new plant would be constructed, it would be necessary to make application for a project rating.

Q.—"You have a defense order and you want to get some repair parts. How do you use your rating in passing that on to a supply company?"

A. (by Mr. Bauman).—"The rating is issued to you by a defense project, say an Army or Navy contract or cantonment. The ratings are issued by them. You would have to study the order under which the rating was given. If the ratings are extendable, then you merely extend to your supplier the rating issued to you. But in order that I don't misinform you, not being familiar with the specific order that you

Mr. Brigham, W. S. Tyler Company; Earl Maxwell, Ohio Mineral Company; Fred Braun, W. S. Tyler Company.

have in mind I would suggest that you be careful to know the extendability features of the rating, or the order under which you obtain the rating.

"A rating of A-1-a, for instance, and A-1-c issued to you under P-56, that you extend to your supplier, is extendable by the supplier to his supplier for raw material only as an A-3. We have, however, had some difficulty on that point. For instance, we would extend to you a rating of A-1-c on Supplier A for a conveyor or a shovel. The dealer who furnished you with that A-1-a rating and extended it on to his source as an A-1-a rating to replenish his supplies or secure the necessary supply parts is not making a legitimate extension. He is authorized under provisions of the order to extend that only as an A-3."

Q.—"Do we classify small tools that are necessary for making repairs, such as electric drills, hammers, and things like that, under an A-3 rating?"

A. (by Mr. Bauman).—"I have been instructing operators to extend a rating of A-8, because small tools are not listed on Schedule A, and because of the fact that small tools, unless they are an exception, are available on the basis of an A-8 rating. They are expendable supplies used in your inventory and can be secured on the A-8 rating."

Q.—"Suppose a small producer has a plant addition to a proposed site for a defense plant. There is sufficient production in his territory, that is in his immediate vicinity, to take care of the defense plant. Will he be issued a serial number and be allowed priority rating to go ahead and expand his plant enough to take care of that particular job?"

A. (by Mr. Bauman).—"For the lack of more specific details pertaining to that type of application, I would say 'No.' We take into consideration the availability of present supply to furnish contemplated defense projects, so that if we could assure ourselves that a sufficient supply of suitable aggregate is already available to adequately serve the needs of the new defense project, from a reliable, established producer, it is very unlikely that a project rating would be issued for expansion or for the installation of a new plant."

Q.—"You made the distinction between trucks operating in a pit or mine and those used in delivery. Suppose a firm keeps doubling its entire fleet around for various reasons, so it uses them in the pit one day or one week, and uses them on deliveries at other times. How could you work that out in regard to P-56?"

A. (by Mr. Bauman).—"That, too, is a question that has been referred to us frequently, but in order to have a

D. B. Mathews, American Aggregates Corporation; Frank B. Ungar, Ludlow-Saylor Wire Company.

definite separation, we have issued the ruling that unless the trucks are used entirely in the pit, they do not come under this order. In fact, we like to have a statement furnished us that the trucks are not equipped with license numbers, as we know that a truck that is not furnished with a license number is not likely to be used on the highway, and therefore will be used entirely in the mine operation. With that type of information we are able to give a decision."

Q.—"Suppose the pits are in another location where you have to cross a public highway and the authorities won't allow you to go across without a registration?"

A. (by Mr. Bauman).—"In that case the answer would be, 'Yes'; you are entitled to use the order for the trucks, provided the trucks are hauling raw material. We have instances where it is necessary to have a license; that is an exception to the general plan. But we usually follow the plan I indicated, specifying that it applies where licenses are not issued on the trucks.

"I would go farther and say if the trucks are used to haul your raw material over several miles of highway to your processing plant, but are used exclusively for that, then you are entitled to call for repairs for the trucks under Order P-56. We try to make a separation as between hauling the raw material in the mines and hauling the finished product. If we mixed cases, such as you illustrated, it would break down the plan we have and provide an 'out' for a 90-per cent. hauling operation and, in order to get coverage, you might now and then use it in the mine."

Q.—"Replacement is, of course, anticipated by P-56. Let's assume, for purpose of illustration, that a screen has reached the end of its useful life according to the test established in P-56, and the producer wishes to purchase a new screen, not for the purpose of expanding his operation but for the purpose of continuing his operation, and the new screen will replace an old screen which will immediately be disposed of as salvage. Is the purchase of the new screen under those circumstances regarded as replacement and reachable under the A-3 rating in P-56?"

A. (by Mr. Bauman).—"It would be entirely within your, may I say, prerogative to order the screen on the A-3 which is provided for you for replacement parts. But the replacement of a screen when it is worn out with a different type of screen would be new equipment and application should be made with the facts submitted, and I am sure that, because it is a replacement piece of equipment, you will have little difficulty in having the rating issued in due time to provide for your continued operation. But the reason for the distinction that I am attempting to make is the fact that it provides us with the information as to the flow of equipment. Now in the replacement of a screen, say a revolving screen, you already have the framework, you have the bearings, and all you need is the perforated plate. That is a repair part for existing equipment and the order provides you with the A-3 rating. However, if you are going to take out the entire revolving-screening equipment and put in the vibratory type, that will involve new motors, new framework and an entire new set-up, and I think is rightfully considered as a new installation of new equipment, and I am sure you have had no difficulty in your applications for a rating under those circumstances."

Q.—"There is much interest in the transfer, or the projected transfer, from the preference-rating procedure to the allocation procedure, and I would like to ask you three questions in that regard.

"(a) What is the status of the project for developing information about the prospective use of critical materials in 1942 by the industries covered by P-56?

"(b) If allocation of critical materials is designed to replace wholly or partially the use of the preference rating certificate, on what basis will the allocations actually be made?

"(c) Will allocations be made to the whole industry, and then to the individual companies, and, if so, what criteria will the War Production Board use in making the actual specific allocation?"

A. (by Dr. Nelson).—"First, let me say that I just had a long-distance tele-

(Continued on page 84)

The screening tower and loading bins where the sizing and classifying are accomplished.

The dewatering station with inclined gravity screen which takes out the gravel.

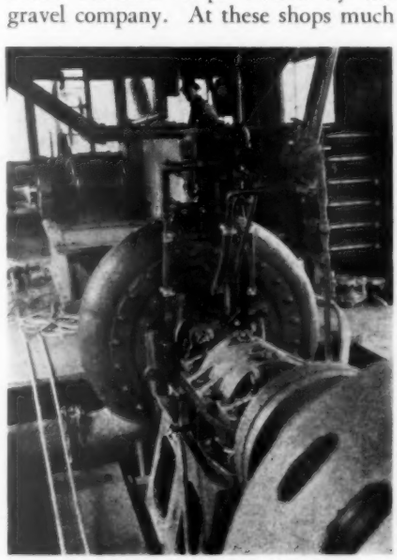
Dewatering Station Reclaims High Percentage of Sand at New Western Indiana Gravel Plant

By HARRY F. UTLEY

PRODUCTION at the Leesburg, Indiana operations of the Western Indiana Gravel Company has been more than doubled following the erection of a new all-steel plant and the installation of a modern dredge, both of which went into service in October, 1941. The new plant replaces an old timber tipple which had been in operation for many years. The dredge replaces a cableway excavator which had been unable to reach a large portion of the material available in the 160-acre deposit. General Manager M. A. Neville and Superintendent Frank Sanders expect that the new equipment will assure an annual capacity of about 250,000 tons compared with the 90,000 to 100,000 tons formerly produced. Eight or nine men will be able to handle this increased production, about the same size crew used in the old plant.

A feature of the new plant is a huge dewatering station, designed to prevent the wasting of fine sand. Sand is the chief product at Leesburg, accounting for 75 to 80 per cent. of the total output. Practically all the sand is shipped by railroad to the Chicago area for building purposes, while the gravel is disposed of locally.

The American Steel Dredge Company fabricated the 20- by 40-foot hull of the new hydraulic dredge and it was assembled on the site. The deck-house is of corrugated steel. The A-frame and boom were built at the Elwood, Indiana machine shops owned by the gravel company. At these shops much of the structural equipment and operating machinery used in the eight plants of the Western Indiana Gravel Company is constructed, rebuilt and repaired. All the steel bins, conveyors, plant and dewatering-bin structures mentioned here were built by the forces at Elwood.



The 10-inch dredge pump.

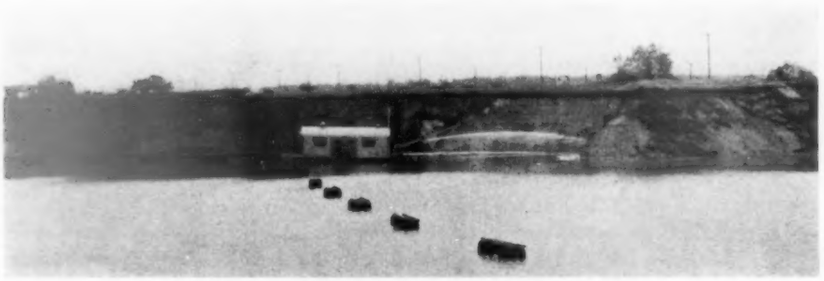
The 25-foot bank is caved with a jet on the dredge and the 12-inch suction line can operate as deep as 32 feet below the surface. The Amsco 10-inch Counterflow dredge pump is driven by a 250-foot G. E. motor. An American Hoist & Derrick Company 3-drum hoist moves the dredge and suction line. A Dean-Hill 4-inch high-pressure pump driven by a 40-horsepower G. E. motor serves the wash-down jet and supplies priming water. Pontoons support the marine cable which brings power to the dredge.

The discharge line, carried on four-drum pontoons, is composed of 10-inch Naylor spiral-welded pipe sections. Most of these sections are 40 feet long and are connected with rubber sleeves. A sufficient supply is on hand to make up more than 1,000 feet. The material is discharged into a surge bin above the dewatering station on shore and fed over an inclined gravity screen

View from highway showing the old plant (left) and new structures.

about 100 square feet in area. This screen takes out gravel over ½ inch in size and discharges it into a bin. The minus ½-inch material passes to a large-capacity dewatering bin with a V-shaped bottom which operates as a settling tank, the overflow being flumed back to the pond. Gates at the bottom of the bin are arranged in line to feed the material to the 280-foot Quaker belt-conveyor which runs up to the top of the screening tower. There are two gates for gravel and four for the dewatered sand. The coarse material is placed on the belt first to ballast the sand up the incline. Corrugated metal sheets are being applied to inclose the conveyor.

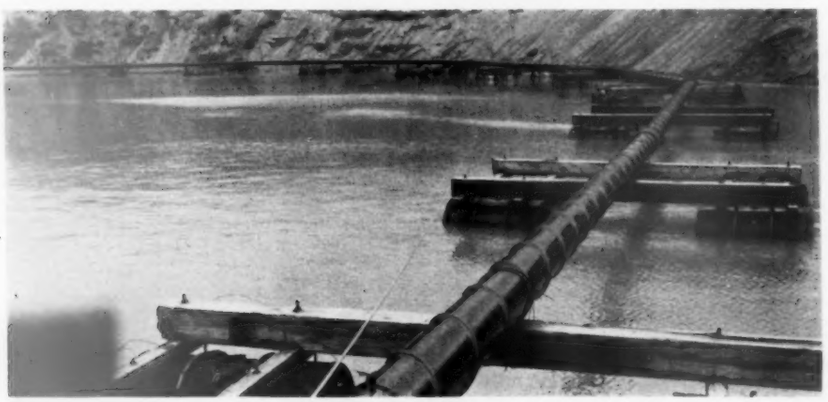
At the top of the screening plant the conveyor feeds the material to a 5- by 12-foot Productive Equipment Company Gyroset triple-deck screen which sizes the sand. Since the proportion of gravel is small, the load on the ⅜-inch top deck is not severe. The oversize is chuted to a 4- by 8-foot Tyler-Niagara double-deck screen which makes three sizes of gravel, the cloth being changed frequently to meet purchasers' requirements. A crusher is to be installed in closed circuit with this screen later.



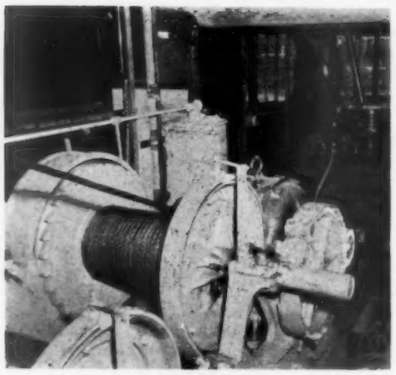
Dredge in operation with jet washing down bank.

The Gyroset screen has Number 4 mesh on the middle deck and Number 8 on the bottom. The three grades of sand thus separated pass through settling tanks designed and built by the company, and the sand is discharged through butterfly gates into bins. All the bins are equipped for loading both railroad cars and trucks. The bin capacity totals only 160 cubic yards, since the material is usually loaded direct into railway cars as produced. A Barber-Greene loader and an Orton clam-shell crane are used to handle material at the surplus stock-piles.

A De Laval 1,200-g.p.m pump, direct-driven by a Westinghouse 40-horsepower motor, supplies wash water from the pond, both vibrating screens being equipped with Link-Belt spray nozzles. Tyler Ton-Cap cloth is used on all the vibrating screens.



The spiral-welded discharge line.



Hoist aboard the dredge.

The Western Indiana Gravel Company maintains its general offices at LaFayette, Indiana. Besides the Leesburg operation, it has plants at Anderson, Dundee, LaFayette (2 plants), Marion and Mishawaka in Indiana and at Ionia in Michigan with a combined annual capacity of about 2,000,000 tons. Improvements are going on almost constantly, keeping the Elwood machine shops busy. Among recent changes was the installation of a 24-inch by 600-foot Quaker belt-conveyor at the Number 2 plant at LaFayette to transport material from the pit. A locomotive and cars formerly served.

Triple-deck sand-sizing screen.

At the Anderson plant a Gyroset 4- by 10-foot double-deck vibrating screen has gone into service to do the sizing formerly accomplished by revolving screens. Bin structures were also rebuilt and a new deposit opened across the White River from the plant. Motor trucks are now bringing the material to the plant over a relatively long route using the nearest bridge but plans are in progress for the erection of a belt-conveyor to span the river.

American Aggregates Rebuilds Plant 13A in Oxford District

View showing the No. 1 and No. 2 belt-conveyors with surge stock-piling and reclaiming system at left.

THE American Aggregates Corporation has for many years followed a program which has kept its numerous plants on the average far above the level of efficiency of the sand-and-gravel industry in general. They are kept up-to-date with constant improvements and, when necessary, are rebuilt or replaced by new plants. A recent example is Plant 13A, the former Ray Sand & Gravel Company plant at Oxford, Michigan. During the winter of 1940-41 the original revolving screens in this plant were replaced with vibrating screens and a new screening-and-washing building was erected over the old storage tunnel. A new raw-material stock-piling and reclaiming system was completed in October, 1941, and a re-washing screen was installed in the car-loading building. The plant capacity is now in excess of 300 cubic yards per hour.

Other changes were to have been made but had to be postponed because of the demand, which kept the plant running two 10-hour shifts daily during the extended operating season. Most of these improvements are now under way. A Symons 4-foot short-head cone crusher is being installed for added fine-crushing capacity and an Allis-Chalmers Gates Number 7½ Type K gyratory crusher will replace the present machine of the same size. The two scrubbers, which were installed for temporary use in this plant, are being replaced by two improved-type Allswede scrubbers equipped with manganese-steel lifters, cones, etc. These scrubbers are being mounted on permanent steel supports. An additional cone classifier may be installed to increase the recovery of extremely fine sand. Other improvements contemplated are the installation of air gates on the field hoppers and a conveying weigher in the plant.

The history of the corporation's operations in the Oxford area is long and rather involved. Plant 13A was originally built by the United Fuel & Supply Company about 1915, later becoming the Ray Sand & Gravel Company. American Aggregates took this plant over in 1928 and operated it until December 1935. Also in 1928 the old Fuller-Becker plant near Oxford was taken over and operated as Plant 13B until late in 1930. In January 1936 the Ray Industries, Inc., took back Plant 13A and operated it until January 1940, when it reverted to the American Aggregates Corporation. Meanwhile, in January 1936, American Aggregates again took over Plant 13B and made extensive improvements to it. These were described in the April 1937 issue of PIT AND QUARRY. When Plant 13A was again taken over, Plant 13B was dismantled and most of the

Diesel-electric locomotive as rebuilt from an electric-railway car.

Car-loading building (left) and the screening and storage structures.

By W. E. TRAUFFER

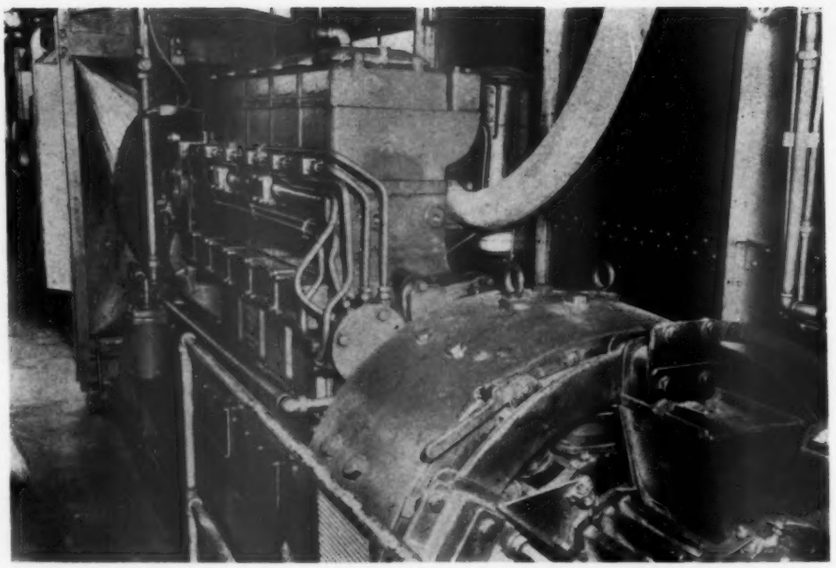
equipment distributed among others of the Corporation's plants.

The glacial deposit from which this plant obtains its material is typical of the Oxford area, which has been one of the most important sources of sand and gravel in this country. The overburden, averaging five feet in depth, is removed by a Thew Lorain ¾-cubic yard drag-line and trucks. From 40 to 100 feet of the deposit is above the water-level and the material taken from it is loaded by two drag-lines. Because of the high percentage of sand below the water-level, little of this material is removed. The loading is done by a Bucyrus-Erie Class 50-B Diesel drag-line with a 2¼-cubic yard bucket and a Bucyrus-Erie Class 14 electric drag-

The V-belt-driven 4-foot reduction crusher.

line with a 2½-cubic yard bucket. These are to be replaced by a Bucyrus-Erie Class 24 electric drag-line with a 5-cubic yard bucket. The drag-lines load separate steel hoppers, one of 40- and the other of 80-cubic yard capacity, with 20-in. spaced rail grizzlies. These hoppers straddle the loading track and are moved from place to place on cars by means of special jacks. These hoppers discharge into 35-cubic yard bottom-dump steel ore cars which are hauled to the plant in trains of three by a Diesel-electric locomotive. The 5,000-foot trip up a slight grade from the pit to the plant is made in 6 minutes. The locomotive was made from an old electric-railway freight car. The four original 100-horsepower motors drive the car and power for them is supplied by two 250-horsepower Cummins Diesel engines, each connected to a 300-kv.a. generator.

At the plant the material is dumped on an 8-inch rail grizzly over the track hopper. The throughs are fed by a 42-inch Jeffrey vibrating feeder on a 36-inch by 160-foot inclined belt-conveyor (Number 1) which operates at a



One of the two 250-horsepower Diesel engines in the locomotive.

speed of 383 feet per minute. The oversize goes to an 18- by 36-inch Allis-Chalmers Blake-type jaw crusher and a short belt-conveyor feeds the crushed gravel to the Number 1 conveyor. When feeding direct to the plant, the material is discharged on the Number 2 belt-conveyor. When this conveyor is stopped, the material drops on the new 36-inch by 120-foot inclined raw-material-stock-piling belt conveyor, the end of which is 69 feet above the top of the concrete reclaiming tunnel. This tunnel has two openings of which only one is now being used with a live-storage capacity of about 3,000 cubic yards. A Jeffrey 36-inch by 7-foot apron-feeder under the tunnel opening supplies the 36-inch by 110-foot reclaiming belt-conveyor and is driven by chain from its tail pulley. The material is discharged from this conveyor back on the Number 1 conveyor.

The Number 2 belt-conveyor is 36 inches wide and on 160-foot centers. Its discharge is split to a pair of 60-inch by 12-foot Greenville revolving screens with 2¼-inch openings on their main sections and 4½-inch openings on their 5-foot overhanging sections. This screen makes the separation for crushed and uncrushed gravel, all gravel over 2½ inches in size being crushed and that 2½ inches and under being separated into various uncrushed grades. The minus 2½-inch material goes to the washing department which will be described later. The 2½- to 4½-inch gravel goes to a Symons 4-foot cone crusher and the plus 4½-inch gravel to a No. 7½ Austin gyratory crusher. The products of both crushers are carried by an 18-inch pitch super-capacity bucket-elevator to a 5- by 10-foot Tyler Ty-Rock 3-deck screen. This is equipped with 2-inch perforated

These 4- by 30-foot drags make masons' sand.

plate and 1⅜- and ½-inch wire cloth. Gravel passing over the top deck goes to a 6-inch Allis-Chalmers McCully gyratory crusher and that over the second deck to a 48-inch Symons disk crusher. Sometimes some of the gravel retained on the bottom deck also goes to the disk crusher. The same elevator feeds these crusher products back to the screen.

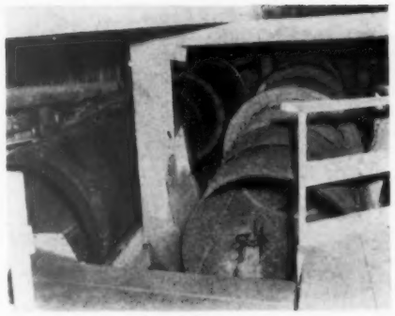
All, or part of, the material retained on the bottom deck of this screen and all that falling through it is carried on a 30-inch by 170-foot belt-conveyor to a 4- by 8-foot Simplicity 4-deck screen. This was originally a 3-deck screen and is equipped with 1¼-inch perforated plate, and ¾-, ½- and 1/10-inch wire cloth. The crushed gravel products off

Two 4- by 8-foot fine-sizing screens which make the final separation.

the two top decks drop into bins and that off the third deck is carried on a 24-inch by 23-foot belt-conveyor to a bin. The 1/10- to ½-inch gravel off the bottom deck goes to a 3- by 6-foot Allis-Chalmers 2-deck screen with 5/16- and 1/10-inch wire cloth. The crushed gravel products off both decks drop into bins. The minus-1/10-inch sand falling through the bottom decks of both these screens is essentially a product of crushing and is flumed to waste.

The minus 2¼-inch gravel from the revolving screens is used only for the production of uncrushed gravel and

A 5- by 10-foot coarse-sizing screen in the crushing department.



The two rotary scrubbers which clean gravel.

sand. It is carried on a 36-inch by 250-foot belt-conveyor to a pair of 5- by 10-foot Tyler Ty-Rock 2-deck screens with 1-inch wire cloth on their top decks and cloth with ¾- by ¼-inch crosswise slots on their bottom decks. The 1- to 2¼-inch gravel off the top decks of these screens goes to an Allswede 60-inch-diameter by 20-foot long scrubber with four internal cones having 3-inch perforations. In each of the four compartments formed by these cones are 75 steel balls 4½ inches in diameter and 50 balls of 3½-inch diameter. The scrubber has a ¾-inch perforated overhang through which soft material is wasted. The scrubbed gravel is carried on a 30-inch by 47-foot conveyor to a 4- by 8-foot Simplicity 2-deck screen with 1½- and ¾-inch openings. The products off both decks drop into bins.

The ¼- to 1-inch gravel off the bottom decks of the two Ty-Rock screens goes to a second Allswede 60-inch by 20-foot scrubber. This has four 2-inch perforated cones and in each of its four compartments are 200 steel balls of 2½-inch diameter and 50 balls of 3½-inch diameter. Soft material is wasted through an overhang with ¼-inch perforations. The three sizes of balls used, 4½-, 3½- and 2½-inch, weigh respectively 13.3, 5.75 and 2.4 pounds each. This scrubbed gravel is discharged on a 4- by 8-foot Simplicity 3-deck screen with ¾-, ⅝-, and 3/16-inch openings. Materials off the two top decks of this screen are at present carried on a 24-inch by 20-foot conveyor to a bin, but later these two products will be kept separate. The product off the bottom deck goes to another bin.

The minus ¼-inch material falling through the bottom decks of the two last-mentioned Ty-Rock screens ahead of the scrubbers is flumed to a pair of 4- by 8-foot 2-deck Simplicity screens with 3/16- and 1/10-inch wire cloth. The products off both decks drop into bins. The minus 1/10-inch or masons' sand is flumed to a pair of 4- by 30-foot sand-drags equipped with Jeffrey chains. A 30-inch by 45-foot belt-conveyor carries this sand to a bin. The overflow from the drags goes into a settling tank from which a 3-inch Amsco-Nagle centrifugal sand pump will feed it to a 7-foot-diameter cone classifier. This sand is discharged on the sand belt-conveyor already described.

The screening-and-washing building is supported on the 13 separating walls which form the aggregate-storage compartments. These walls are similar in design to those of the Columbus, Ohio, plant described in the October, 1940 issue of PIT AND QUARRY. Each wall is triangular in cross-section, with two sides having the angle of repose of the live section of the stock-pile, and extends 18 feet above the top of the reclaiming tunnel. Above this level the wall is made of wood. Of the 14 storage compartments 13 are now being used. The total live-storage capacity over the tunnel is 5,000 tons. This is reclaimed through two openings under each pile except for six openings for masons' sand. Under each opening is a chute with a sliding gate which is marked so that any desired blend of two or more materials can be made on the tunnel belt-conveyor. Crushed and

Apron feeder beneath the surge stock-pile.

uncrushed materials can be blended separately or together. Concrete sand is made by blending the masons' sand with 3/16-inch pea gravel and sometimes some ¼-inch pea gravel, depending on the specifications.

The fine sand is reclaimed on a 30-inch by 92-foot belt-conveyor in a branch tunnel which feeds the 30-inch by 485-foot conveyor in the 308-foot main tunnel. Gravel is discharged from this conveyor on a 4- by 8-foot Simplicity 2-deck washing screen over the 5-cubic yard hopper from which cars are loaded on either of two tracks. When trucks are loaded, a 30-inch by 160-foot belt-conveyor carries these materials to four 88-cubic yard truck-loading bins. When sand is being loaded into either cars or trucks the screen is by-passed. Truck shipments are weighed on a 78,000-pound capacity Howe truck scale equipped with a Weightograph. Most of the output is

(Continued on page 69)

Crushers Arranged Flexibly So Plant Can Keep Up With Quarry Changes

One of the three trucks which haul stone from the partly-developed quarry to the primary crusher at the plant.

WHILE many new crushed-stone plants are built each year, most of these either replace older plants or obtain their stone from quarries already developed. It is at least a little out of the ordinary when a new plant starts from "scratch" by opening a new deposit. This is what was done by the Superior Stone Company at King's Mountain, North Carolina. This company, with headquarters in Raleigh, was formed late in 1939 and almost immediately proceeded with the development of this property, putting the new plant in operation on April 24, 1940.

While the plant was being built the overburden, averaging 6 feet in depth, was being removed from that part of the deposit to be developed first. A shovel and trucks were used for this work. When the plant was ready, the quarry had been developed sufficiently to keep it operating at near capacity. During the first year of operation the development was continued until a temporary level 30 to 35 feet below the surface had been reached. All this time the gyratory crusher eventually to be used for secondary reduction was used as the primary crusher. On April 23, 1941 the primary jaw crusher was installed in a temporary location at the edge of the quarry, thereby increasing the capacity of the plant from 100 tons per hour to its designed 150 tons per hour. After a year or two, when the quarry will have been developed sufficiently and its floor lowered to its intended level of about 45 feet below the surface, the primary crusher will be installed permanently at that level. A long inclined belt-conveyor will then carry the stone from the primary crusher to the plant.

The deposit is a hard and brittle blue limestone and is being worked in benches with an Ingersoll-Rand wagon-drill and jack-hammers. Later a well-drill will be used for the full 45-foot face. Electric blasting caps are used to detonate the deep-hole charges and safety fuse for the shallow-hole charges. Du Pont 40-per cent. gelatin explosive is used exclusively.

The stone is loaded by a Bucyrus-Erie 50-B steam shovel with a 2-cubic yard dipper. A fleet of three trucks hauls the stone up the incline from the quarry to the primary crusher. One of the machines is a Ford cab-over-engine truck with a Thornton Tandem drive and an 8-ton body. The others are a Corbitt truck with an 8-ton body and a Euclid truck with an even larger body.

The 60- by 48-inch Traylor primary jaw crusher reduces the rock to 6-inch size and under. A Yale spur-geared block over this crusher is used to handle large rocks and crusher parts. A 42-inch by 111-foot inclined belt-conveyor with Quaker belting discharges the stone over a sloping grizzly with 4-inch spacing at the top and 5-inch at the bottom. The material passing over this grizzly drops into a 14-inch Traylor Type T Bulldog gyratory crusher from which the minus-4-inch product, together with the grizzly throughs, falls on a sloping stationary screen with 2-inch openings. The oversize from this screen drops into a 3-foot Symons standard cone crusher. The minus-2-inch material which goes through the stationary screen is carried on a 30-inch by 146-foot belt-conveyor to the top of the screening building.

The stone is discharged on a 4- by 12-foot Tyler Ty-Rock 2-deck screen. When filter stone for sewage-disposal plants is being made, this screen has 2½- and 3¼-inch openings on its top deck and 1¾- and 2½-inch openings on its bottom deck. The oversize off the top deck is discharged into a 100-ton bin, from which it is fed on an 18-inch by 109-foot belt-conveyor which carries it back to the reduction crushers. This stone is discharged into a split chute from which it can go to either the 3-foot cone crusher, a 2-foot Symons standard cone crusher, or both crushers. The two crushers' products are discharged on the conveyor to the screens.

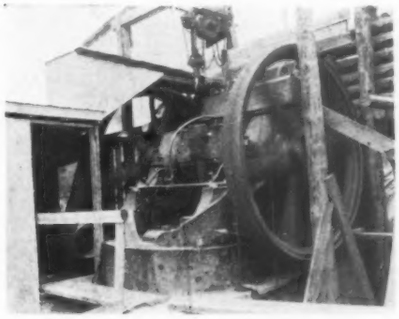
This plant view shows the primary crusher at right, the secondary-crushing department and the screening building.

The cab-over-engine truck discharging into the primary crusher.

Another truck discharging its load into the primary crusher.

The stone passing over the bottom deck of this screen is large filter stone and is discharged into a 50-ton bin. The stone falling through the first section of the bottom deck of this screen is 2-inch filter stone and goes into a bin. The stone falling through the 1¾-inch second section of the bottom deck goes to a 3½- by 8-foot Nordberg Symons 2-deck screen.

When filter stone is being produced, this screen has 1¼- and 1⅜-inch openings on its top deck and the bottom deck is blank. Both products then go to bins. Both screens are operated dry when filter stone is being produced.



The 60- by 48-inch primary jaw crusher with its V-belt drive at left.

When the plant is operated to produce ordinary commercial stone, sprays are used on both screens and the bottom deck of the second screen is equipped with screen cloth. The second screen then produces several sizes of stone from the 2-inch size down.

Looking down on the 2- and 3-foot cone reduction crushers.

Both truck and train shipments are made and the trucks are loaded under the bins. For railway shipments the trucks now haul the stone to cars on a siding but a conveyor-and-bin system is to be installed for direct car-loading. Trucks are also used to build up stockpiles of sized stone.

Some of the fines produced are sold locally for agricultural or other purposes but most of it is wasted. When running wet, this material is pumped to a waste-pile by a Georgia Iron Works centrifugal sand pump. An Ingersoll-Rand Cameron Motorpump, driven by a 25-horsepower motor, brings wash-water for the plant from a channel which was cut from a creek to within ¼ mile of the plant. A Cameron Motorpump driven by a 10-horsepower motor is used for quarry drainage. The air for quarry drilling is supplied by a Sullivan compressor.

Sea Water as Source of Potash Studied

The great potash resources that in the past have supplied the world's requirements are the bedded deposits of Germany, France, Poland, Spain, Russia, and, more recently, the United States. Not much of the potash of Europe moves very far from its base of supply now that the countries are embroiled in war. Scientists of several of the countries in which no potash is found have experimented from time to time trying to invent methods of extracting it from sea water in commercial quantities. These attempts have been made not so much because there is such a relatively large quantity to be had from sea water (only 5 parts of K_2O equivalent in 10,000 of sea water) but because there is so much sea water available. Bromine is found in sea water in even smaller quantity (less than 1 part in 10,000), yet a method has been devised to extract it commercially, as at the plant near Wilmington, North Carolina.

Previous to the development of the bedded potash deposits and the recovery of potash salts from the brines of lakes and marshes in the western part of the United States, it was thought by some operators that potash might be recovered profitably from the bitterns of the solar-salt plants on the Pacific Coast that use sea water, but no commercial undertaking resulted.

About the most recent of the foreign developments noted by the Bureau of Mines is a Norwegian process that reached the pilot-plant stage in 1940. This process, which was patented by the Norsk Hydro Elektrisk Kvaelstof A. S., disclosed that dipicrylamine (hexanitrodiphenylamine) would act as a selective agent to extract the potash from the sea water, making a compound from which the potash could be recovered and the precipitant regenerated for re-use.

Information Available on Dolomite Resources

Increased importance of dolomite in the victory program as a source of magnesium metal for the aircraft industry and of furnace linings in great demand by the steel industry, has resulted in publication of a pamphlet and map by the Bureau of Mines on sources and uses of dolomite. Construction of plants to utilize ground dolomite in combination with other ores and chemicals in the manufacture of magnesium metal has been authorized by the Defense Plant Corporation, according to the Bureau report.

A copy of the pamphlet and map may be obtained by writing to the Bureau of Mines, Department of the Interior, Washington, D. C., for Information Circular 7192, *Occurrences and Uses of Dolomite in the United States* by Shirley F. Colby.

Plant 13A *(from page 67)*

shipped by railway through direct connections to the Michigan Central and Grand Trunk lines.

In this plant, as in all others built or rebuilt by the corporation, all the design and construction work was done by the company's forces under the direction of F. D. Coppock, president, and J. C. Patty, chief engineer. Goodrich belting is now used on most of the plant belt-conveyors but the Number 1 conveyor and the new raw-material stockpiling and reclaiming conveyors have Republic belting. All the screens, crushers and conveyors in this plant are driven through Gates V-belts. Some of these, in use where oily conditions exist, are of full Neoprene construction. General Electric motors predominate. The wash-water is furnished through a 16-inch pipe-line from a pond 800 feet away by two 8-inch Allis-Chalmers centrifugal pumps.

A Planned Power-Transmission System

By E. R. RATH
Vice-President
Power Transmission Council

IN an attempt to learn what the present trends in industrial power transmission might be transmission manufacturers, salesmen, mill-supply houses, power users, consulting engineers, trade-paper editors, etc. were recently interviewed. The opinions expressed were as varied as the individuals interviewed. Analyzed, they indicated that there was no marked trend toward any particular type of drive, and the different expressions were occasioned more by recent personal experiences and possible biased thoughts than by factual data.

This difference in opinion in regard to drive trends is logical, and is a further proof that there has yet been developed no drive that is universally applicable to all jobs—a "cure all" for transmission problems. Each type of drive has definite characteristics that make it particularly applicable to certain conditions, but which also, unfortunately, limit it as far as other applications are concerned. Each transmission problem must be carefully analyzed, all the facts relating to it determined, and from these facts the right drive for that particular job selected. The drive chosen must be the one from which can be obtained the largest possible production of a specified quality per dollar of initial investment and at the lowest attainable operating cost. There is no room for personal prejudices and biased opinions.

In modern industry there are two general types of industrial power transmission: individual drives, and modern group drives. Both have definite applications as well as economic limitations that make their consideration necessary on every job. Electric motors and controls, as well as the same fundamental types of mechanical drive equipment, are used in both.

Individual motor drives have their most general application for machines:

1. Remotely located from others,
2. Infrequently and intermittently operated,
3. Requiring extreme mobility,
4. Having special operating characteristics preventing their logical grouping with other machines adjacent to them,
5. Requiring comparatively large quantities of power,
6. Equipped with intricate and complex controls for quick starting, stopping, reversing, etc., and
7. Performing a multiplicity of operations that require that they be fitted with several arbors or shafts located at wide angles to one another, and operating at widely different speeds.

In group drives two or more machines are so arranged as to be driven from the same source of mechanical power. Modern group drive differs from the old or ordinary group drive in that the machines connected to it are arranged in smaller groups, usually in production units. The shafts are shorter and smaller in diameter, are driven at higher speeds and are supported by hangers carrying antifriction bearings. The hangers are so located as to provide proper support for the shafting at the pulleys where it is most needed, and are usually bolted to stringers so fastened to the building structure as to make possible, where necessary, easy and rapid changes in the location of machinery. The pulleys, belting and other transmitting media used are of the proper type and capacity to carry machine peak loads.

In a planned power-transmission system both individual motor drives and modern group drives are utilized. Its application involves:

1. The collection of all the facts and data pertaining to the machinery and drives in question.
2. A study of:
   (a) The manufacturing methods and the production process.
   (b) The characteristics of the machines to be driven.
   (c) The general plant lay-out and building construction.
   (d) The location of the machines and their relationship to one another.
   (e) The means of reducing motions of operators to the minimum.
   (f) The proposed methods of materials handling.
3. The selection and application of the correct drive for the job.

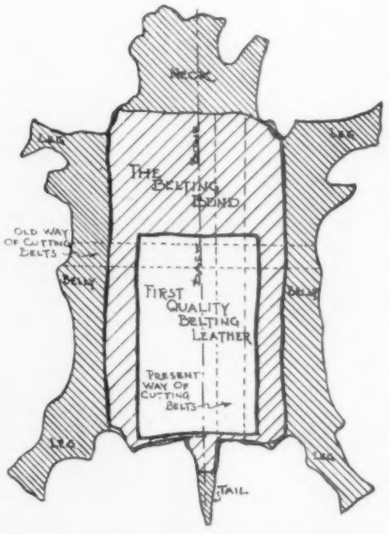


Figure 1. How a hide is cut for belting.

A planned power-transmission system, properly designed, should include all the latest developments in industrial power engineering and retain the fundamental principles of economical production. It involves every type of electrical and mechanical drive equipment. In addition to flat belts and pulleys, it utilizes V-belts, chains, speed-reducers, variable-speed units, clutches and any other related equipment and accessories. With it may be used any kind of electric motor, whether direct-current or alternating-current, induction or synchronous. All kinds of control equipment, whether mechanical or electrical, manual or automatic are applicable to it.

Observations and case studies made in a variety of different industrial plants, show that in the average factory through the application of planned power transmission:

the connecting horsepower is reduced 26 per cent.,
the cost of initial installation is lowered 41 per cent.,
the power factor is raised from 60.5 to 84.8 per cent., and
the drive efficiency is increased from 76.9 to 82.5 per cent.

These figures are concrete evidence of the desirability of studying and designing the drive for every machine, and not simply blindly selecting the first drive that happens to come to mind.

An industrial drive usually has at least two functions to perform: (1) transmitting the mechanical power from its source—the rotating shaft of the motor or other prime mover—to the machine where it is to be used; and (2) changing the r.p.m. of the drive shaft to a speed adaptable to the job at hand. It is therefore necessary that every drive be considered in the light of these two functions.

One of the most common and, at the same time, satisfactory means of transmitting industrial power is through belting and pulleys.

Except for those formed from steel and paper, practically all belts are made from the hides of animals, or from ropes and fabrics woven from the fibers of cotton, hemp, flax and hair. Until the art of combining rubber, balata and other gums from tropical trees with cord and fabric had advanced, the hides

of cattle were rivaled as a belting material only by bare ropes and fabrics. The introduction of these materials, however, gave to cord and fabric three qualities that were to destine them to their present positions as belting materials namely, protection against atmospheric conditions, better coefficient of friction, and the bonding and cushioning of the cords and fabric.

The basic shapes of belts are flat, round and V. The flat and round shapes come naturally from the materials used early in belt making. Hides and fabrics are flat and ropes are round. The V shape developed from rope-drive practice where the advantage of the wedging action was discovered in using round ropes in V grooves. Each belt shape has its own peculiar working characteristics regardless of the materials used or its construction.

All sides of a round belt are presentable to the pulley so that a single round belt may be turned, twisted or crossed.

The V-belt, by its wedging action yields a high tension ratio of great advantage, but it must be made of firm material to keep its accurately molded or cut shape. V shapes when applied to most industrial drives of over about 1 horsepower must be used in multiple strands, thereby creating the serious problem of uneven distribution of load and stretch among the strands.

The flat belt as generally used is always a single strand and it therefore automatically distributes its load and stretch within itself. It will operate on any flat pulley. It is the most readily-adaptable shape for taking fasteners or endless construction. It bends more easily than any other shape and is relatively less affected by the wear and tear

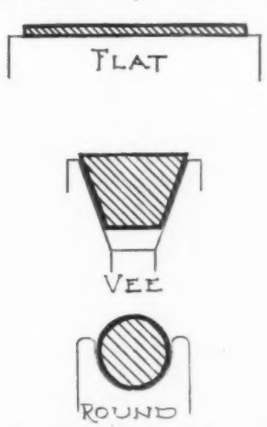


Figure 2. Basic belt shapes.

of flexure—the common enemy of belts. On short and vertical drives, the maintenance of flat-belt tension was once a serious problem. This has been successfully solved by the recently perfected pivoted motor base, which provides automatic tension control and makes available the advantages of the flat-shaped belts to short-center drives.

In the case of belt drives there must always be some slip or lost motion, and even though it is quite small in most cases, this slip might be a disadvantage in the successful operation of certain machines. When power must be transmitted between two shafts with no slip, gears are commonly employed. By the

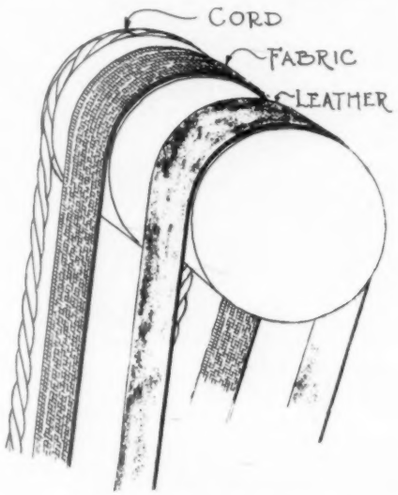


Figure 3. Basic belt structures.

use of toothed gears it is possible to drive shafts which are parallel and intersecting or which are neither parallel nor intersecting in such a way that the rotation of one shaft will produce a very definite motion of the driven shaft. There are many cases, such as interconnected parts of a single machine or batteries of synchronized machines or materials-handling devices, where the application of gears provides the best solution of the transmission problem.

If the shafts are separated at a distance greater than that for which gears are practical, the same advantages can be obtained, together with some additional ones, by the use of a chain drive. In this type of drive the gears or sprockets are meshed not directly with one another but through the medium of the links of the chain. The comparative rigidity of the chain maintains the speed ratio between shafts constant and yet its flexibility enables it to absorb, to a certain extent, the shocks of a rapidly-changing load.

Clutches are used in a great many different ways in a power-transmission system and are available in many sizes and designs. As in the case of other drive elements, there is no one universal clutch applicable to every condition, and the selection of the right one for any particular installation requires careful consideration of the service requirements. Due to the diversity and multiplicity of clutch design, construction and application, the recommendation of a reliable clutch manufacturer is the best assurance of the most economical selection for a given job.

Although there is an almost endless variety of equipment used in industrial power transmission, none of it is so complicated that it can not be readily understood. If all personal and biased opinions are laid aside, if a study is made of the actual drive requirements, and if a little "horse sense" is used in the selection and application of drives, a great many operating headaches may be eliminated, production costs reduced, and complete satisfaction obtained.

Loading Phosphate Rock in Tennessee

Much of the responsibility of keeping the phosphate-milling operations of the Charleston Mining Company, Inc., Mt. Pleasant, Tennessee, going at a steady pace rests with this Marion Type 38-A 2½ cubic yard drag-line, which does 24-hour stripping and loading duty. Both removal of the overburden and loading out of the phosphate are handled by the drag-line.

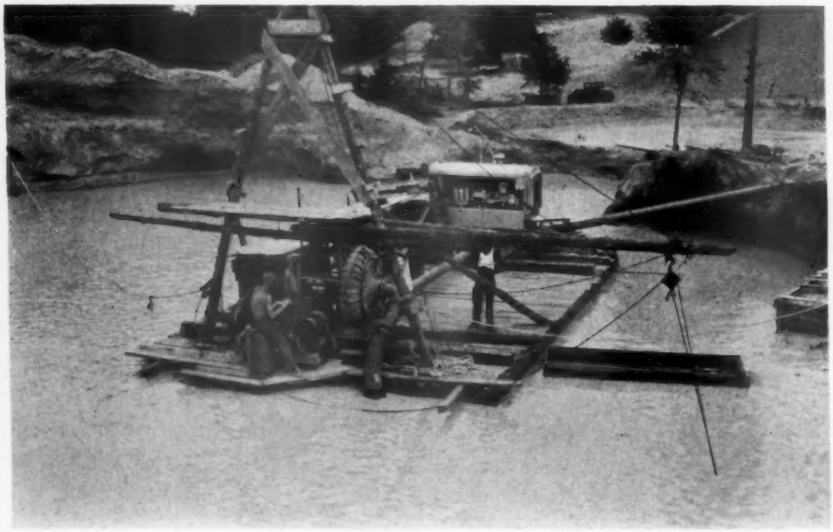
Operating Views as Caught by the Camera

Crushing 400 cubic yards of gravel each 9-hour day is the regular job of this Allis-Chalmers E-60 power unit mounted on the portable plant operated by Mason County, Michigan.

A Model T2 Traxcavator mounted on a Caterpillar tractor at work in the limestone mine of the Annville Stone Company of Lebanon, Pennsylvania. The unit has been in regular service since March, 1941, according to Manager Ralph N. Bogar.

At Grand Coulee Dam, this Caterpillar Diesel tractor equipped with a LeTourneau bull-dozer is pushing sand into the hoppers which feed a concrete-batching plant. The lake formed above the dam is 350 feet higher than the river below.

A Lima 101 shovel and a Baker bull-dozer are here shown at work in what is believed to be the world's largest deposit of diatomaceous silica near Terrebonne, Oregon. The material is marketed by the Oramite Company for various industrial purposes.



The dredging operation characteristic of the deep South pictured above is owned and operated by the Yazoo-Tennessee Gravel Company near Olive Branch, Mississippi. The Butler 8-inch pump is powered by a Caterpillar D1 3000 Diesel engine and about 500 tons of sand and gravel up to 2½ inches in size is produced during an average 8-hour day.

At the Silver Anniversary Banquet those most prominently identified with the history of the association sat at these three tables. At the far table sat the present officers. At the second table were the past presidents and representatives of those deceased. At the lower table sat the past presidents of the Manufacturers' Division.

N. C. S. A. Marks 25 Years of Service to Industry at Silver Anniversary Convention in Cincinnati

CELEBRATING the twenty-fifth anniversary of the National Crushed Stone Association, 437 producers, manufacturers' representatives, publishers' representatives, associations officers and employees, speakers and guests gathered at the Netherland Plaza, Cincinnati, for the three-day convention sessions and machinery exposition that opened there on February 2. No fewer than 76 producing companies were represented by 192 of their owners, officers and operating men. There were 42 exhibiting companies (including the two business magazines serving the field) who, together with the 9 firms who had no exhibits, sent 201 representatives to explain the merits of their products.

The first day's sessions opened with a report on business conditions in the crushed-stone industry presented by the association's retiring president, J. A. Rigg (Acme Limestone Company, Fort Spring, West Virginia). Except for the Metropolitan New York area, all the districts in the country reported a larger volume of production and sales in 1941 than in 1940. Much of the growth in business was attributable to the defense program. In some districts plants operated at full capacity, although in most parts of the country there seems to be ample capacity above the current demands. The industry's producing capacity had been increased in some places by the construction of new plants erected at or near the sites of defense projects.

Prices generally showed an increase, but nothing of an importance to justify scrutiny by the Office of Price Administration of the War Production Board. The demand for highway stone and railroad ballast was about "normal," both markets having shown some increase. The output of fluxing stone increased greatly due to the greater activity of the steel industry. The demand for agricultural limestone showed a considerable increase, and there was some growth in the demand for stone for general construction purposes. Aside from the increase in the demand for fluxing stone, the major portion of the output went into defense construction.

The outlook for 1942 must take into consideration an expected serious curtailment of highway construction, except where this is necessary to maintain defense activities, but maintenance work is expected to continue on a normal basis throughout the major part of the year. A decline is looked for in miscellaneous building construction. The demand for ballast should show some increase due to the greater burdens to be placed on the railroads. Agricultural limestone is expected to continue in demand, although the inability to get tires may have some effect in retarding the normal increase. Not much increase can be expected in the demand for fluxing stone as the steel industry has been almost completely occupied for more than a year.

It is believed that the increasing demand for stone for defense construction may have "spotty" effects in increasing stone production, fully occupying some plants while leaving others active only part of the time. Prices are expected to rise in harmony with increasing costs.

No serious shortage of railroad cars has been experienced, but increasing movements of war materials and the inability of water shipping to care for the increases that might otherwise occur in coastal shipping are expected to increase the shortage of cars available for stone shipment. The difficulty of obtaining tires will force much highway traffic to the railways.

All sections of the country report difficulties in getting repair parts and supplies owing to the restrictions imposed by WPB priority ratings. Unless the erection of new plants or the expansion of existing ones can be justified on the basis of war expediency or necessity, it will be virtually impossible to get new machinery and equipment.

Mr. Rigg said that the crushed-stone industry recognizes the gravity of the situation that confronts the country in the prosecution of the war and that its members expect to perform their part by producing to the utmost of their capacity when called upon to do so and to accept their share of the "dislocations and sacrifices that the transition of our nation from peace to a war footing makes necessary."

He said, too, that the values of trade-association membership are now more obvious than ever before, and that now the association's executives are working in close coöperation with government bureaus in an effort to be of maximum usefulness to the country and the industry.

The association's engineering director, A. T. Goldbeck, in discussing *And Now, What of Research?*, emphasized the growing importance of maintain-

ing and, if possible, expanding the body's research activities. There is much that the association can contribute through its engineering staff and laboratory toward the development of important information, new practices, and the like, that will further the national effort for victory and that will inure, too, to the benefit of the industry.

The remarks of Dr. Wilbur A. Nelson, head of the Mining Branch of the War Production Board (formerly Administrator of Mine Priorities of the Office of Production Management), and a report of the questions asked by producers and the answers given by him and Edward W. Bauman, Technical Adviser on Nonmetallics to Dr. Nelson, are given on pages 56 to 62 of this issue of PIT AND QUARRY.

At the greeting luncheon Harry W. Flannery, Berlin correspondent of the Columbia Broadcasting System, from the retirement of William L. Shirer in 1940 to October of last year, interested his listeners with his *Berlin Report—Uncensored.*

The Monday afternoon group meetings—one for superintendents and operating men and the other for salesmen—are reported elsewhere in these pages, 78 for the former and 76 for the latter.

John C. Gall, formerly counsel of the National Association of Manufacturers, New York, brought up to date his audience's information on the rulings and interpretations under the Fair Labor Standards Act of 1938 (popularly known as the wage-and-hour law) and the Walsh-Healey Act, which fixes the labor standards for contractors working on government orders.

The Value of Organized Effort was the subject of an *ex tempore* address by Colonel Willard Chevalier, publisher of *Business Week,* who had addressed this association's members on previous occasions. He dwelt this time on the difficulties of organization, the pitfalls of concerted effort. He referred to the enormous growth in organization work and criticized the tendency of the American people to overorganize, not from the standpoint of disapproval of the organization idea but because of the fact that they do not always recognize organization as having a purpose. Organizations often continue to exist long after their useful purpose has been accomplished. When that point has been reached in the history of any organization, "fold it up and let's divert our energies toward something more useful," he said. "Let's not worship organization for the sake of organization," he added.

He criticized, too, the naïve belief that the mere existence of an organization formed for a given purpose is in itself a guarantee that that objective will be attained. He said that every member should try to contribute something definite and material in the way of coöperative effort to insure the success of the organized enterprise, and that he should not expect to leave the tasks to committees in the expectation that somehow everything will be properly planned and done. "Coöperation," according to the speaker, "means getting another guy to help me get what I want." As an example he cited the publisher: "Everybody has an idea that the man who is in control of printers' ink should be coöperating, and what does he mean? He means beating his old tom-tom, that is all; he means pulling chestnuts out of the fire for him; he means forwarding his interests. 'What we need is coöperation,' he says, and what he means is that we ought to be doing something to help him."

The speaker called coöperation a "two-way street." No organization, he said, can succeed unless the individual member is willing to pour into it as much as he expects to take out. If all members pour something into it, all will take more out of it, for that is the result of coöperative effort.

He deplored the simple faith in leadership and the expectation that leaders alone will get things done. "Leadership has its natural opposite and its natural complementary quality, followership," he said. "Unless you have good followership, good leadership avails nothing. That is one of our troubles with the war effort; everybody wants to be a leader. Everybody talks about leadership and management and what they are going to accomplish for us. I say to you," he added, "that the greatest weakness of the American people in the effort that confronts them now is a certain lack of self-discipline, which comes from the fact that we are all obsessed with the idea that we all ought to be leaders, that we all are potential leaders, that one man is as good as another, and a damned sight better, which isn't true, only we have told it to ourselves so long that we have come to believe it.

"The outstanding quality of our people in confronting an emergency such as we have to-day is that we are an undisciplined lot of people. Here we are, thrilling with pride to-day over what MacArthur and his men are doing in the Philippines, and rightly so. . . . I want to tell you that not once, not a score of times, but a hundred times a day my thoughts turn to those men over there. While we are here in comfort and peace enjoying ourselves, what are they doing? Maybe one who has not lived through it doesn't know what they are doing, but some of us do. And why are they doing it? Why did those Marines on Wake Island write a deathless chapter in American history?

Another view of the banquet with the three honor tables in the background.

The annual breakfast of the Manufacturers' Division was, as usual, well attended.

Why? Because they were disciplined men, that is all, trained and disciplined.

"How few there are in this country who are trained and disciplined? You know, it was only a few months ago that, just because we had a lot of our boys in camp, just because we had a lot of our boys getting peace-time training, many of our people were impatient and sore and upset about it, and loose-lipped Congressmen were rising on the floors of Congress and belly-aching about the fact that the boys were being mistreated and pushed around, and 'nobody could do that to American boys,' and they were standing there and assuring the fathers and mothers of America that their protecting arms were about their boys, and that nobody could push them around.

"Do you think you make a disciplined people that way? No! Do you think you make a disciplined people by coddling them, by sending motion-picture actresses around to put on a show, and hostesses to hold their hands and stroke their hair? Rats! That is not the way you build morale. The way you build morale among men is to give them the toughest, rottenest job you can find for them to do, and say, 'Boys, there is your job; go ahead and do it,' and when they have done that tough, rotten job, give them a little pat on the back. That is all they want. They don't want to be coddled. That is not the way to build morale."

The speaker said that too much of this coddling spirit pervades business organizations, and its presence explains why so many well-intentioned and deserving programs come to naught.

Colonel Chevalier complained of the attitude of many Americans, particularly those in the Middle West, toward the prosecution of the war. He called the conception that we can not lose this war "the most dangerous state of mind." Time will be an important factor, said the speaker, "but even more important than time is the question of what use we make of the time." The war "isn't going to be won by waiting; it isn't going to be won by time. . . . The question isn't whether or not we have the resources—the material resources—to win the war. The question is 'Have we the moral resources to spend fifty billion dollars, not for just one year, but for two years, for three years, for four years. . . . It is quite possible that we may be whipped on the moral front, regardless of all our material resources, unless we come to be one-half as disciplined a people as the Germans or the Russians or the Japanese."

The speaker returned to the subject of his address by saying that in his opinion the big job that associations must face during the year is that of exchanging experience. An association, he said, can perform its greatest service to its members "in effecting the quick, sustained exchange of experience, so that all can meet new problems, so that all can recognize them before being faced with their solution." Among the problems of importance are those created by priorities, shortages in manpower (particularly skilled man-power), and shortages in the use of the industry's product. The problem has shifted from that of how much money can be saved to that of how much time can be saved, even, perhaps, to that of how we can keep going at all, at any cost.

On the subject of labor he said, "Let us not delude ourselves for one minute into believing that the increasing influence of labor is a passing phase that is going to go out of the window. It isn't. American labor to-day is in a stronger position than it has ever been in its history. It is claimed to-day that 10,000,000 men are members of labor unions, whereas in 1900 there were only 500,000. About 4½ per cent. of the working force of the nation were members of unions in 1900; to-day something like 23 or 24 per cent. are reputed to be, and the trend is increasing. . . . In my opinion wide-awake industrial management in this country is going to negotiate frankly and fairly and readily all those questions that are legitimately within the field of the working man's interest, because only as we do that are we going to be able to fight successfully the 'muscling in' of labor politicians into the field of management where they have no business at all, and where their contributions can not be for the general welfare."

The problems presented by the increasing interest in business shown by government was mentioned also by the speaker. He said there are three ways in which industry can attempt to solve the problem: (1) by attempting to stand off the extension of government into the field of business, (2) by surrendering everything, while government marches in and takes possession of the whole industrial-management function, and (3) by coöperatively working out the relationship in such a way that the blessings of the existing system can be preserved "for the American people." He blamed the American business man for being on the defensive and showing indifference to the problem by adopting the attitude that "I don't want anything to do with it. It is none of my business, and we don't want the government in our business. Leave us alone." The speaker said that we ought to realize that we will not be left alone, and that therefore it is "up to us to work out policies and attitudes that will enable us to preserve what we have, the essence of what we have, regardless of how we may have to modify it in detail in order to fit the changing needs of the time." To do this is one of the opportunities of organizations such as that serving the crushed-stone industry.

At the banquet Tuesday night H. W. Prentis, Jr., president of the Armstrong Cork Company and past president of the National Association of Manufacturers, talked of the "Roots of American Liberty."

An important feature of the banquet was the tribute to those "who have outstandingly contributed to the growth and development of the National Crushed Stone Association during the twenty-five years of its life" delivered by Otho M. Graves. He traced the history of the organization from its founding to the present day, naming former officers and describing briefly the work they had done, and discussing some of the problems that confronted the industry at different times. He mentioned, too, some of the memorable happenings at the various annual conventions, some of which, especially during the days of prohibition, afforded opportunities other than those provided by the usual business sessions.

On Wednesday morning the producers of agricultural limestone held a

group meeting and in another gathering the producers of bituminous concrete; these meetings are reported on pages 80 and 81 respectively. A report of the afternoon session is given on page 83.

The convention elected the following officers and regional vice-presidents for 1942:

President, W. M. Andrews; administrative director, J. R. Boyd; engineering director, A. T. Goldbeck; treasurer, W. E. Hilliard. The new regional vice-presidents are: Eastern, F. O. Earnshaw; midwestern, Paul M. Nauman; southeastern, W. T. Ragland; central, W. C. Sparks; northern, A. J. Cayia; western, A. J. Wilson; New England, T. C. Cooke; southwestern, W. F. Wise.

The executive committee is composed of the following: W. M. Andrews (chairman), Otho M. Graves, E. J. Krause, Paul M. Nauman, Russell Rarey, J. A. Rigg, Stirling Tomkins, and A. L. Worthen.

The two new members of the board are: G. A. Austin (Consolidated Quarries Corporation, Decatur, Georgia) and W. H. Lindsay (Canada Crushed Stone, Ltd., Hamilton, Ontario, Canada). They replace A. R. Couchman (New York City) and Porter W. Yett (Portland, Oregon).

SELLING PROBLEMS

(National Crushed Stone Association convention, Monday afternoon)

At a special session for salesmen, a small but enthusiastic group heard a number of helpful suggestions toward solving some of the varied, complex problems encountered in disposing of their product.

With T. Ward Havely (Central Rock Company, Lexington, Kentucky) presiding, the first speaker, George E. Schaefer (district sales manager, General Crushed Stone Company, Rochester, New York) pointed out the value of a standard sales contract. Although there are many acceptable varieties of such contracts, Mr. Schaefer made an analysis of the contract his company is using and which it evolved in its final form after considerable study. This contract has been so well drawn up that it has been adopted as "standard" by the New York and Pennsylvania state associations.

After the usual preamble defining the "seller" and "purchaser," the contract gives: (1) the name and location of the project on which the materials are to be used, (2) details of the order, including sizes, quantities, price, shipping, instructions, etc., (3) transportation data, placing liability for any subsequent increase in rates on the purchaser, (4) terms of payment, (5) time of delivery, dates and hours being indicated, (6) specifications, (7) claims, including the right of the "seller" to refuse to honor claims for rejection of the material until the rejected material is inspected by him, and (8) assignment and acceptance of the contract.

Mr. Schaefer stressed the special importance of a good, standard sales contract in the present emergency, recalling the troubles the industry encountered during World War I, when protective clauses in contracts often proved extremely valuable.

R. C. Shepherd (Carbon Limestone Company, Youngstown, Ohio) brought up the question of liability for freezing in transit and it was generally agreed that the matter might also be included in the contract. The type of car should also be specified, it was decided, since unloading and handling methods at the point of delivery vary and if the car type is clearly defined in the contract, any friction may be eliminated.

A discussion of increasing crushed-stone sales in winter, led by Paul R. Anderson (sales manager, Marble Cliff Quarries Company, Columbus, Ohio), proved of genuine interest. Mr. Anderson pointed out that equipment developments of recent years have made it easier for the crushed-stone producer to quarry and process material and that educational programs sponsored by the Portland Cement Association have largely eliminated the winter concrete "bugaboo." Thus the industry is becoming more and more non-seasonal and plenty of winter business is apparently available for the producer who will observe a few precautions.

Another winter market that is growing is the use of finely-crushed stone (5/16 inch and under) combined with calcium chloride for ice control on the highways. It was the opinion of many of those attending that much quarry waste can be disposed of at good prices for this purpose. It was also brought out that less calcium chloride is needed with crushed stone than with sand, cinders, etc., while the angularity of the crushed particles is an important added advantage.

Selling, delivering and spreading agricultural limestone can best be done in the winter months, too, it was indicated. Farmers have more time at their disposal in cold weather for distributing agstone and, with the ground frozen, vehicles can do the distributing and spreading much more easily than later on when fields are muddy and often impossible to traverse.

J. Harper Fulkerson, Cross Engineering Company, was re-elected chairman of the Manufacturers' Division.

Mr. Anderson referred also to weather-bureau statistics indicating that winter temperatures have been above normal in 15 of the last 20 years in the northern part of the country. His conclusion was that the winter months offered more of a mental hazard rather than an actual deterrent in the aggregates business.

"The greatest objection encountered in selling stone sand is that it is not clean and contains too much dust," said A. W. McThenia (sales manager, Acme Limestone Company, Fort Spring, West Virginia), who led a discussion on the topic *The Marketing of Prepared Stone*

Photographs of all the past presidents of the association were displayed in one of the booths in the exhibit hall.

H. E. Rainer, Federal Crushed Stone Corporation; James Savage, Buffalo Crushed Stone Corporation; R. P. Holderbaum, Stedman's Foundry and Machine Works; Harvey N. Clark, Dolomite Company, Rochester, New York.

Sand. Others expressed the same view, implying also that old prejudices among builders, such as the one that stone sand was "crusher dust and dirt," often had to be broken down by explaining modern separating methods and backing up the argument with technical proof that stone sand, properly processed, is one of the best fine aggregates available.

Mr. McThenia told of his company's success in marketing the product and described some of the important projects on which it is being used.

It was brought out that concrete-products manufacturers are using large amounts of stone sand in the making of blocks, preferring it because it produces a light-colored, more salable unit which, at the same time, is strong and durable.

Leonard J. Lewery, Cross Engineering Company; Ralph C. Johnson and F. D. Barber, Simplicity Engineering Company; Otho M. Graves, General Crushed Stone Company.

Although Verne C. Morgan (Kentucky Stone Company, Louisville) was unable to attend to present *Should Salesmen Be Required to Make Collections?*, some spontaneous discussion developed on this topic. In general, the consensus of opinion seemed to be that some effort should be made by the sales force to get accounts paid. The reasons advanced in favor of the idea were: (1) that salesmen were better known to the customers and had a good chance to present the collection appeal tactfully, (2) that salesmen are familiar with discount-period expirations and could follow up on collections at the proper time, ostensibly to help their customers by reminding them of the resultant saving, and (3) that it avoids duplication of effort and saves the expense of sending out a collector.

AMERICA IN THE WAR

(National Crushed Stone Association convention)

The odds are about 5 to 1 against air raids being made on United States cities this year by German bombers, Marcel W. Fodor, noted European correspondent, told those assembled at the luncheon sponsored by the Manufacturers' Division on Tuesday. Mr. Fodor has spent the past 21 years in Europe as a foreign correspondent for American and British newspapers. Vienna was his headquarters until this once gay capital fell into the hands of the Nazis in 1938. He then moved on to Prague, to be pushed out again after a few months when Hitler conquered Czechoslovakia. He was in Holland when the blitzkrieg began on the Western Front in May, 1940. When the Dutch capitulated after four brief days he went to Belgium and lived through the inferno which total war brought to that country, and was then plunged into the Battle of Flanders. He was with the Allied troops at Abbeville and at Rouen when those cities were the center of the British evacuation and under a deluge of bombs and gunfire from the Nazis.

The speaker intimated that, had England fallen as Hitler planned in 1940, Germany would have pushed westward, establishing bases in Greenland and attacked Canada and the United States. Hitler, suffering from a mania that President Roosevelt is persecuting him, will probably try to attack us unless restrained by his general staff, said Mr. Fodor.

Full of praise for General MacArthur, our gallant leader in the Philippines, the speaker said he was well equipped to lead his military forces against the enemy because of his personal close-range studies of their military technique.

With all Germany's wrath against the terms of the Versailles treaty it is a fact, Mr. Fodor stated, that Germany collected as much reparations from France in 7 months of the present war as France exacted from Germany in 7 years after World War I.

If the United States makes up its mind to go "all out," to make every sacrifice necessary, victory is certain, the speaker declared.

"Defeatism is our greatest and most dangerous fifth-column movement," declared Fulton Oursler, dynamic editor of *Liberty* magazine whose forceful talk on *The Enemy Within* opened the final session of the convention on Wednesday afternoon.

While the elimination of pessimistic reasoning and talk were held to be our greatest need, Mr. Oursler would have this country do three other things to win the war, "(1) eliminate all foreign-language newspapers, (2) deny the right of free speech to all known communists, 'bundists' and the rest of their ilk, and (3) get Harry Bridges out of the country in a hurry."

The speaker urged a return to the self-sufficiency of our forefathers, in the present emergency at least, declaring that too much dependence on government for our own security has softened us to the point where we are first forced to whip ourselves into shape to endure the hardships of war before we can win.

Some personal liberties will have to be sacrificed until the war is won, just as the sick individual goes to a hospital and gives up some of his rights until he recovers, said Mr. Oursler. He insisted that this war is reaffirming our faith in a universe founded on order, and a belief in that kind of democracy which we call "Americanism."

"That faith, that belief is a heritage not likely to be lost. Forgotten in a measure in prosperity and peace, it strengthens us to-day in a world at war. With it we can not lose."

Hugh Wilson, one of the few career diplomats ever to attain top rank in

the United States Foreign Service, brought the Wednesday morning session to a close with an enlightening talk on *America's Rôle in the World Crisis.*

Japan, he declared, will live to regret its wanton and unprovoked attack on Pearl Harbor. Having served in both Germany and Japan, he impressed his listeners with intimate anecdotes illustrating the militaristic attitude prevailing in both nations. While the youth of both countries are willing to sacrifice all for their leaders, he believes that this sacrificial spirit would break down should either country suffer a shattering defeat in prolonged battle.

Japan's attack, Mr. Wilson believes, was not ordered by Hitler at all but was undertaken by the Japanese to gain an advantage of their own. "Had Hitler been able to order the Japanese around he most certainly would have ordered them to attack Russia to relieve the pressure on Germany many months ago," he declared. "We are really fighting two separate wars—two separate attempts at imperialism."

As this country's "last" ambassador to Germany, Mr. Wilson talked often with Hitler and he recalled some of these conversations to show how instinct, more than reason, causes him to act.

"Hitler is staking all on assuming control of his armies over the advices of his general staff. If he wins battles he gains in stature with the German people. If he loses, he will lose all."

THE CONSERVATION OF CRITICAL MATERIALS

(National Crushed Stone Association convention, Monday afternoon)

The program at the meeting on Monday afternoon was devoted to the discussion of ways and means for conserving critical materials used in the production of crushed stone. R. Merrill Decker, deputy chief of the Industrial Salvage Section, Bureau of Industrial Conservation, WPB, was the principal speaker. He said it is our patriotic duty to release all unusable scrap as soon as possible instead of holding it for possible future higher prices. He advised holding usable scrap.

The ensuing round-table discussion was led by R. W. Cunningham (Canada Crushed Stone Company, Hamilton, Ontario), who first described conservation methods followed by his company. Only valuable scrap is being held, he said, and the junk accumulated during the past few years was sold for about $7,000. Now any scrap metal accumulating is moved out as soon as there is a truckload. Mr. Cunningham said that the electric welders and cutting torches are now the best tools they have and that scrap is used wherever possible in rebuilding and hard-surfacing. It has proved particularly profitable to build up a bead around the perforations on screen plate to increase its life.

C. P. Elgin, Cedarville Dolomite Company; J. R. Callanan, Callanan Road Improvement Company; Dan Sanborn, Lehigh Stone Co.

Max Altgelt (Servtex Materials Company, New Braunfels, Texas) urged good housekeeping as an economy and safety measure and said that repairs should be made as soon as they are found necessary. The life of tires on quarry trucks can be lengthened considerably by keeping the roads clean, and similar attention to other details also pays. Mr. Altgelt said that employees reflect to a considerable degree the attitude of their employers toward any specific problem and that efforts toward conservation by employers would be emulated by them, especially if they are aware of its importance to themselves. He said that in many plants there are leaks which can be compared to hidden taxes because they are unnoticed when paid but add up to a considerable figure over a period of time. He advised the use of the maxim that "what is good for the bee is good for the hive." The absence of discussion on this very timely and vital subject by other producers present made it evident that most of them are not yet aware of the necessity for conservation.

Nelson Severinghaus (Consolidated Quarries Corporation, Lithonia, Georgia) said that he had found over a year ago that it paid to put the tire-maintenance problem of his quarry trucks in the hands of a reputable tire dealer. A man is sent out to the plant once a week to look over the tires. Any necessary repairs are then made and other measures are suggested. A service station in the quarry now makes it unnecessary for trucks to be driven into the plant yard for air, oil, etc. Mr. Severinghaus also stressed the importance of keeping quarry roads clean. He said that it also pays to get the advice of experts on all lubrication problems arising in the use of plant and quarry equipment.

According to the speaker, sheet metal is now very hard to get and he has found it possible in many cases to use hard cast iron instead. Cast manganese steel can also be used in place of plate and metal low in tin can be used instead of high-tin. He advocated the use of stone boxes in chutes to save metal and said that lined wooden chutes can be used instead of steel. The machine- and repair-shop at his plant has been expanded and rebuilt because of the fact that the capacity of local commercial shops is limited. He suggested that producers survey the capacities of

E. Z. Cole and J. D. Hawthorne, General Crushed Stone Company; Bryant Currier, W. S. Tyler Company; Louis G. Uhl, Marion Steam Shovel Company.

J. C. Lawrence, Liberty Limestone Corporation; L. J. Holzman, Parsons Engineering Corporation; J. L. Teaford, Liberty Limestone Corporation; A. M. Andrews, Hopkinsville Stone Company.

their neighborhood shops for handling various types of work which might become necessary.

One producer said that he saved more than 60 per cent. of the zinc usually required as a filler behind crusher plates by using crushed stone as a filler and then finishing up with zinc. It is advisable to do this in 4- or 5-inch layers to give the moisture in the stone a chance to get out.

Another producer said that structural iron also made a good filler.

Still another described the use of concrete for this purpose with about an inch of metal at the surface. The concrete must be absolutely dry before the zinc is poured.

Another uses concrete behind cast-iron liner plates to keep them from breaking due to unevenness in the casting.

One producer had a tube-mill gear break beyond repair and faced the prospect of a 30-day delay even on an A-1-a priority in getting a new gear. A makeshift gear was cut out of a section of old boiler plate which held up until the new one was received.

Another told of the breaking of a pump impeller which would have taken 60 days to replace. Blades were cut out of steel on hand and welded on the original shaft at the proper angle. This impeller, he said, lasted three times as long as the original and took only four hours to build.

Methods for conserving elevator and conveyor belting were also discussed.

Mr. Altgelt then described a method of loading cars in such a way as to prevent segregation. Instead of one gate under a bin he uses three gates placed crosswise of the car so that it is loaded about three times as fast and across its full width to keep the material from rolling. He said that care must be taken to keep the car moving at the right speed and that a car can be loaded in 4 or 5 minutes.

Joe Q. Taylor (New York Trap Rock Corporation) described the methods used to control dust. Dust-collectors are connected to all crushers and to all screens down to a 1½-inch opening as little dust is found in smaller sizes. In the summer, he said, sprays take the place of the collector on the screens and all the stone is rewashed before it is loaded out. He also described a special nozzle attached to an air-hose which is run up and down under fine screen cloth at intervals to clean it.

DIESEL POWER PLANTS

(National Crushed Stone Association convention, Monday afternoon)

A feature of the Monday afternoon meeting was a paper on Diesel power-plants by Elmer Heise, superintendent of the Krause, Illinois plant of the Columbia Quarry Company, and E. J. Krause, president of the company. According to the authors, the company in 1936 analyzed its power situation and found three alternative solutions. One, the use of a steam power-plant, was dismissed from consideration because of its first cost, extra operating problems, and lower efficiency. It was also felt that the use of steam was outmoded for a plant of this size. Utility power was considered but no rate structure, which would indicate an average power cost of less than 2¼ cents per kw.-hr., was available or in prospect.

After careful consideration it was decided to install a Diesel generating plant and this worked out so well that similar installations have since been made at the company's plants at Valmeyer and Prairie du Rocher, Illinois. The original installation which went into operation August 26, 1936, consisted of two Superior engines connected to Allis-Chalmers engine-type generators. The 6-cylinder, 400-horsepower engine drives a 333-kv.-a. generator and the 8-cylinder, 525-horsepower engine drives a 438-kv.-a. generator. Both produce 25-cycle current and operate at 376 r.p.m. Soon afterward a smaller engine with a 15-kw. generator was installed to provide power and lights for the machine-shop, office, etc., when the main engines were idle. All practical protective and control devices were installed and have proved a wise investment. The Hilco lubricating-oil reclaimer was particularly recommended.

The paper stressed the importance of employing a high-grade operating personnel who can be trusted to keep accurate and complete records of power-plant performance and maintenance performed or needed. The employment of such men has proved profitable and through these records actual results are known. These men should be good mechanics but do not need to be specially-trained Diesel-engine operators. Instructions were received from the engine erector and a few of the men were sent to the factory for a short time when the engines were being assembled and tested.

When the engines were installed, fuel oil was purchased in tank-car lots and stored in a 15,000-gallon steel tank. The oil at that time cost 4¾ cents per gallon and now, after five years, it costs no more. The cost of lubricating oil has averaged 50 cents per gallon. At this point it was stated that it is false economy to experiment with low-grade fuels and cheap lubricants and that it is wise to use the ones recommended by the engine manufacturer.

The maintenance cost of these engines was said to have averaged considerably less than 1 mill per kw.-hr. delivered to the switchboard. As the engines grow older and parts need to be replaced, this cost is expected to increase slightly. Most of the maintenance work is done by the engine operators during periods when the engines are not in use. Their reliability was said to be above that of purchased power and in one late year of high production there were only 6 shut-downs totaling 12 hours and only a fourth of this was due to the engines, the remainder being due to auxiliary equipment. The actual lost time on power in that year was slightly more than 1/10 of 1 per cent. of the total engine hours and all the engine time lost since August 1936 has been only 43 hours.

In this plant the momentary "peak" loads were sometimes over the rated

William M. Andrews, Union Limestone Company, the new president of the association.

generating capacity, so in July of 1941 another 500-horsepower Superior Diesel engine of slightly different type was installed. The total generator capacity is now 1,209 kv.-a. or 966 kw. at 80 per cent. power factor and serves a total connected motor load of about 1,575 horsepower, which is not all in service at one time.

According to this paper, a total of 7,061,500 kw.-hr. was produced from August 26, 1936 to January 1, 1942 with a consumption of 636,031 gallons of fuel oil and 4,839 gallons of lubricating oil. The total of all operating costs was $72,215.75. The total cost of purchased power during the same period would have been $158,883.75, so the saving in direct expense in 5½ years has been $86,668.00. The company figures that an annual amount of $3,245.67 at 4 per cent. will retire the original plant investment in 15 years and leave an annual profit of about $12,500.00 on the basis of the above savings.

In closing it was said that Diesel engines were not the answer to all power problems but that whenever power costs amount to more than $500 per month, on the average, consideration of Diesel power may be worth while.

AGRICULTURAL STONE

(National Crushed Stone Association convention, Wednesday morning)

Government Policies and Future Plans Concerning the Marketing of Agricultural Limestone Under the Grant-of-Aid Program was the theme of the Monday morning session. F. B. Northrup, assistant director, Division of Special Programs, Agricultural Adjustment Administration, said that farmers and agricultural-limestone producers must adjust themselves to changing conditions. The Government, he said, aims to expand agricultural production as necessary without sacrificing soil-conservation measures any more than can be helped. Agricultural limestone, he said, is an integral part of any such program. He expects no general restrictions in the near future other than those due to shortages of equipment and transportation facilities.

According to G. W. Mills, chief of the Program Operations Section, Division of Special Programs, Agricultural Adjustment Administration, transportation will be a problem this year. Of the 7,200,000 tons of limestone distributed in 1941 about 89 per cent. was delivered direct to the farm yard on trucks. As farmers are likely to get tires before truckers, he said that railhead delivery to the farmers' trucks was a possibility that should be considered. Mr. Mills also said that there might be a shortage of bags.

Mr. Mills then said that steps are being taken to eliminate from the program the illegitimate bidder who has no equipment at the time of the letting and is unable to produce at the low price at which he usually gets a contract. Producers whose products do not meet specifications are also being eliminated. As for fair prices, Mr. Mills said, this is distinctly a local problem. It was stated that county committees now investigate a bidder before he is given a contract.

In the ensuing discussion it developed that only one specification is established in the North Central Region and that no county or other body has the authority to alter this or to promote additional grades. The fair price now applies to bid material only and not to other materials produced on assignment, but may later be applied to additional grades.

According to A. B. Rodes (Franklin Limestone Company, Nashville, Tennessee), a similar fair-price procedure has been in effect since June on seeds and anyone who can provide them at the set price is eligible. Mr. Rodes elaborated on the difficulty of determining a fair price even for a state because of the widely-varying conditions and advised that this be done on a township basis.

J. R. Bent, secretary of the Midwest Agricultural Limestone Institute, Chicago, Illinois, said that the present system of contract bidding has upset for many producers years of development of a satisfied clientele. He also said that the use of a contract deadline is a serious handicap and that a zoning of grades should be made so that plant operators whose product is just under the line would not be hurt as much as those whose product comes far under the requirement.

Mr. Northrup then described the Fair Price Procedure which was established primarily for seeds but can be expanded to cover agstone and many other items. He said that the reaction of farmers in general on the application of the procedure to seeds was not favorable at first but that it is improving and will ultimately make available more of the producing facilities than was possible under the old bidding procedure.

Mr. Mills said that producers at a recent meeting in Buffalo voted against the establishment of a fair price in that area mainly because of the difficulty of establishing a formula that would be fair to all. He said that the fair price and bid procedure can hardly be used at the same time. It was explained that once a fair price is established a farmer can buy from anyone he chooses at this price. Many open-market purchases were made by the Government in 1941 in areas where the demand far exceeded the contract

In this group are A. L. Worthen, F. H. Edwards, and R. D. Brewer of the New Haven Trap Rock Company and R. S. Walker, C. H. Roberts and O. E. Thaleg of the Traylor Engineering and Manufacturing Company.

and was beyond the capacity of the contractor to produce. Others mentioned the difficulty of estimating the probable needs of a county in advance and said that the uncertainty about tires, labor, etc., probably makes it more difficult for a farmer to estimate his needs now than when the program was first begun.

Bruce Campbell (Harry T. Campbell Sons Company, Towson, Maryland) raised the question of priorities in getting equipment for an indefinite contract like one for 1 to 10,000 tons. He said that many farmers are also willing to pay the difference in cash to get a higher grade of agstone than that specified.

Mr. Northrup then pointed out that under the fair-price procedure there might be no contract involved but only approved producers who would sell at the determined price. This price, he said, would be determined by the secretary of agriculture under the present law. He then asked that a vote be taken to see whether those present at the meeting would like to see the fair-price system tried out either in place of, or in conjunction with, the bid system. Few seemed to be in favor of either method.

A producer who is on the tire-rationing board in his city described some of the procedure through which an applicant must go in order to obtain tires and said that he thought few truckers would be able to qualify. The farmer, he said, is in a preferred position and a producer using his own trucks is in a fair position if he can prove that he uses these trucks mainly for hauling agstone. Another producer cited the case of a trucker who is granted tires to haul cattle to the Chicago yards but is not permitted to haul agstone on the return trip as he formerly did. It was also thought possible that a farmer might still be eligible if he also hauled agstone for others.

ASPHALTIC CONCRETE

(National Crushed Stone Association convention, Wednesday morning)

A special session for bituminous-concrete producers opened with a talk by A. H. Hinkle of the Asphalt Institute on bituminous-pavement construction. Mr. Hinkle substituted for the institute's chief engineer, Bernard E. Gray, who was unable to be present.

The enforced curtailment of the use of private automobiles and the resulting cut in highway funds will bring about an increased use of economical asphalt to stretch the available funds to pave the needed mileage, the speaker predicted. More plant-mixed and mixed-in-transit materials will be used, he said, for new construction, for widening shoulders to increase the traffic-carrying ability of existing roads, and for maintenance.

C. L. Schuster and Paul M. Nauman, Dubuque Stone Products Company; A. C. Gossard, Iowa Manufacturing Company; Ward N. Shaw, Mack Truck Company.

Revised specifications are shortly to be issued by the Asphalt Institute, said Mr. Hinkle. These will clarify the issue on aggregate sizes and the proper grade and penetration of bitumen to be used for various types of work. The speaker pointed out that penetrations of 70 to 85 are right for ordinary traffic conditions, 85 to 100 for heavily-traveled thoroughfares, and 120 to 150 for extreme service, such as airport runways.

"The reduced income from the gasoline tax will be seriously felt," said the speaker. "And, even with the economies effected through a greater use of mechanically-stablized stone foundations, there still will not be sufficient funds to reconstruct highways which are now in varying degrees of obsolescence. Just as the automobilist is now taking better care of his tires, even to the extent of patching them and nursing them along for an indefinite period, so must the highway engineer patch and nurse along the great majority of highway miles throughout the land. The order of the day will be 'salvage, repair and resurface,' rather than the building of any large new mileage of replacement highways. However, this does not mean that work on the highways will be stopped, because their unimpaired use is vital to our very existence. But it does mean that the maintenance engineer will have a bigger job than ever to keep the present network of roads in a state of high efficiency. It will mean surface treatment on thousands of miles of road, and heavier surface treatments in many instances than have been carried on previously when replacement with a new pavement had been planned for an early date.

"Often a road that is congested when 18 feet wide becomes entirely adequate for traffic when 24 feet of surface has been provided. Hence, we shall see a great deal of shoulder widening, the elimination of the high crown, and leveling courses and new surfaces over the widened area. Surface-treatment equipment and road-mixing equipment will be utilized to the maximum in work of this kind, and of course the crushed-stone producer will be confronted with the necessity of providing the necessary aggregates for such work. As a result of this heavy maintenance, many roads which appeared to be obsolete will be found to be less so than was supposed, and these heavy maintenance methods will continue to be employed in modernizing many highways where entire reconstruction previously had been thought to be the only corrective."

The speaker concluded his talk with the following summary:

(1) The building of the "engineered" subgrade foundation is the most important development in present-day paving practice. It is particularly important at this time when there is such a great strain upon transportation facilities. Utilization of crushed-stone, available, as a rule, within a short truck haul, often will meet the need in the most economical and satisfactory manner. Upon such foundations asphalt surfaces 2 to 5 inches thick will carry the heaviest loads.

(2) The extraordinary development of construction equipment has a marked effect upon the trend of asphalt construction. Asphalt plants are becoming widely available; they are rugged and economical and plant mixes are being increasingly used for surfacing.

(3) Present new-pavement construc-

tion will be limited to needed access roads serving defense areas and expanded industrial communities, together with airports. The quantities involved in airports alone are tremendous. Each of the 14 new air bases recently announced by the War Department involves over a million square yards of pavement.

(4) For the immediate future work on the highway system will be largely maintenance, repair and salvage. This maintenance, however, often will be of heavier character than formerly and will require large quantities of crushed stone for the purpose.

Bitumen does not adhere to all aggregates equally well in the presence of water and sometimes the premature failure of bituminous roads is due to this cause. The significance of this "stripping" action and the way to overcome it were pointed out by A. V. Bratt, laboratory chief of the Massachusetts Department of Public Works in his paper, *The Adhesion of Bitumen to Aggregates.*

"Crushed stone is without question the fundamental material in pavement construction," declared Mr. Bratt, "and crushed stone-bitumen pavement construction has contributed more than any other type in the development of our highway system. Any factor that affects the success of crushed stone-bitumen pavement is, therefore, of extreme importance. It is this fact that has brought the subject of adhesion of bitumen to aggregates into such a prominent position. There is a tendency incorrectely to assume that the investigators in this field have been spurred on by the discovery of some fundamental weakness in the stone-bitumen pavement. This is not true. Your industry makes such a tremendous contribution to the road-building program that any help that can be given to it is in the nature of a major effort and is in itself important.

"If we could take crushed stone and knit it together into a pavement that would act as a solid mass of stone, there would be no need for introducing any other material into the pavement, with the possible exception of contraction and expansion joints. We can approach this condition by grading the stone so as to provide interlocking action of the particles and compacting it to produce maximum internal friction, but we can not avoid two serious weaknesses. The pavement does not have the necessary resilience to prevent permanent distortion or rutting under wheel loads and the mass is not waterproof and so is subject to the damaging effect of water collecting in the voids. Bitumen is introduced into the pavement to overcome these two weaknesses. The bitumen in itself is a water-repelling material; it fills the voids and adheres to the aggregate. Thus the water problem is taken care of and the binding properties of the bitumen enable the crushed-stone particles to act as a unit and resist permanent distortion, that is, *provided the bitumen adheres to the aggregate particles.*

"In recent years the nature of the stone itself has been specified as an important condition governing the adhesion of bitumen to aggregates, and aggregates have been classified as "hydrophobic" or "hydrophilic," indicating a difference in resistance of the adhesion obtained to the forces exerted by water acting to destroy the adhesion."

Bitumen adheres to hydrophobic stone naturally. But hydorphilic stone requires treatment, either of the stone itself or of the asphalt binder, Mr. Pratt declared, and went on to explain how this is accomplished.

"There are several processes for treating bitumen. All that have come to my attention involve treatment at the bitumen plant by the manufacturer. The properties that control the methods of handling the bitumen, such as the consistency, and flash and fire points are not changed to any appreciable amount. The treated bitumen can be manipulated the same as untreated bitumen. The adhesive qualities are greatly increased and results can be obtained with treated bitumen that can not be obtained with regular bitumen.

"The processes for treating aggregates are much more diversified. In one method the aggregate is treated in a mixer. The aggregate is placed in the mixer and an emulsified solution is introduced. The aggregate is thoroughly coated with the solution and then about one-half of one per cent. of powdered quicklime is introduced. After thorough mixing the stone is ready for use or may be stock-piled for future use.

Stuart H. Fulkerson and J. Harper Fulkerson, Cross Engineering Company; Stirling Tomkins, New York Trap Rock Corporation.

"In a second method the aggregate is coated with a thin film of heavy tar in a mixer. The coated aggregate is introduced into a drier and subjected to an open flame until the tar has carbonized. The aggregate is then stock-piled for use.

"In a third method the aggregate is coated with a treated crude-tar primer. One-half of one per cent. of treated crude-tar primer is sprayed on the stone as it is unloaded from the bins or in a mixer, depending upon which method is more convenient. The aggregate is then ready for use or can be stock-piled.

"A fourth method involves the use of a water-soluble product. A 10-per cent. solution is made, using hot water. The aggregate is coated with one-half of one per cent. by weight of solution in a mixer. The aggregate can be stock-piled, as the coating that is formed on the surface of stone is insoluble in water."

In the discussion which followed Mr. Bratt's paper, I. H. Boggs (General Crushed Stone Company, Easton, Pennsylvania) declared that trap rocks usually offer little difficulty in bituminizing, while stone high in silica needs treatment since such stone strips easily. He also urged that local and state associations form bituminized-concrete

H. A. Johnston, John P. Peacock, Bethlehem Steel Company; Max A. Altgelt, Servtex Materials Company.

Among the ladies present were Mrs. J. A. Rigg, Mrs. A. W. McThenia, Mrs. Fred Earnshaw, and Mrs. Grace M. Evans.

divisions to improve the quality of bituminized material.

A movement to gain recognition for stone sand in standard specifications for bituminous mixtures was urged by several of those attending. Natural sand is usually specified and, while local permission can usually be got to substitute stone sand for the natural variety when evidence is presented showing the good results which can be obtained, it was felt that either type of sand is satisfactory and optional use of either type should be recognized nationally.

DAMAGE FROM BLASTING

(National Crushed Stone Association convention, Wednesday afternoon)

Many quarry operators are faced with the very real problem of conducting blasting operations in urban areas, a situation resulting from the rapid growth of cities and their encroachment on quarrying operations which originally were located far beyond city limits. These conditions have in many instances resulted in claims for damage from blasting. How to oppose these claims was the subject of an address by Harold Williams, a Boston attorney well-known to the industry.

Complaints, said Mr. Williams, will fall into two classes: (1) damage due to flying rocks, and (2) indirect damage due to vibration caused by blasting. The former is unusual but, when it occurs, there is no recourse but to pay. The claims for damages due to vibration are usually unjust, and it is up to the quarry operator to present evidence in each case to prove the point. Scientific measurement of ordinary blasting operations will prove that the resulting vibrations are too small to cause damage which, in most cases, is confined to cracks in walls and falling plaster. The concensus of expert opinion, said Mr. Williams, is that fourtenths of an inch, or less, of amplitude in the vibrations is not damaging, and seismographic recordings of such blasts will usually show an amplitude reading far below that. This opinion, Mr. Williams declared, will also be expressed in a Bureau of Mines investigation on the subject, soon to be published. It will conclude, he said, that "the seismic effect of quarry blasting is no more damaging than ordinary street traffic or that caused by occupants moving about in a building."

Mr. Williams, enumerating the precautions to be taken by the quarry operator, urged that all license requirements be strictly complied with, that a record be kept of all shots, drilling and loading data, with the date and time of each detonation accurately recorded. Seismograph readings should also be made periodically and a record of the readings kept. Since most damage claimants will offer cracked walls in evidence, he urged that a competent engineer be employed to study such cracking. In almost every instance, he said, settlement, expansion or contraction is really at fault, but the burden of proof lies with the quarry operator.

"Defend every case; make no appeasement. Once you settle out of court, you invite an avalanche of other claims from property owners in the vicinity. Even though the plaintiff agrees to settle for a small sum, less than it would cost in time and money to fight the case, you will be better off in the long run to defend each suit to its conclusion. Armed with good evidence, you are almost certain to win," Mr. Willaims concluded.

THE HIGHWAY OUTLOOK

(National Crushed Stone Association convention, Wednesday afternoon)

Charles M. Upham, engineer-director of the American Road Builders' Association, spoke on *The Highway Outlook* and prefaced his remarks with a *resumé* of the elaborate economic studies made by his organization in order to acquaint Government and the people with the great need for more and better highways which, despite the great construction already accomplished, have failed to keep pace with the growing volume of traffic.

"Since the present highway program is restricted to construction for war purposes only, the development of facilities for peace-time use will have to wait until the war is over. The amount of work left undone will depend upon the severity of the setback. This, with the normal expanding demand for better highway transportation, sets the stage for a huge future highway-construction program.

"There must come a transition period from war-time to peace-time activity and there will be urgent need for an employment-producing program. Expenditures for purely relief purposes do nothing to build up the economic structure. Projects undertaken must be chosen for their durability, for the general welfare, and for their future usefulness if they are to be effective. Highways are in this category, and perhaps the greatest asset lies in the fact that a large improvement program can be quickly started and the resulting improvements utilized immediately.

"This country can not afford a post-war economic disaster with its business failures and unemployment. The most effective way to take up the slack is through highway construction, because this type of public works gives more employment and better distribution than any other. Highways are needed in every community—they give maximum employment almost as soon as they are started and they induce new investment. Highway projects can be initiated in any size necessary to meet the needs of employment and use of materials and equipment. Furthermore, the value of the highway as a utility is reflected in every phase of the national economy.

"Highway construction in the months just ahead will be restricted to only those projects absolutely necessary to the war effort. This work would include roads in and around army posts, stations, airports and naval establishments. Also there would be included some work in industrial areas which, due to the sudden influx of war

workers, resulted in transportation conditions which make it impossible for the personnel to travel to and from industrial plants and offices.

"The effects of the curtailment on the highway industry and profession are in many respects problematical. The contracting industry must necessarily suffer in localities where there is little or no war activity, resulting in a large amount of idle equipment. Highway maintenance must be continued and this will at least justify organizations for this work. It is doubtful, however, if fully-manned highway organizations will be necessary for the current construction program. There

Abe Goldberg, Allis-Chalmers Manufacturing Company, and L. J. Boxley, Blue Ridge Stone Corporation.

will be a gradual absorption of highway engineers into military activity.

"The materials industry should fare better, for as long as the military machine continues to expand there will be a demand for materials for access roads, airports, industrial plants and buildings. Construction is estimated at a record figure of $11,250,000,000 for 1942.

"Concerning equipment, it is interesting to note the procedure during the last war. There were 45 durable-goods industries affected and, of these, road-making equipment manufacture was

P. S. Frederick and H. W. Newton, Barber-Greene Company; Paul M. Nauman, Dubuque Stone Products Company; Norman E. Kalb, Cumberland Quarries, Inc.; C. L. Schuster.

one of the few recommended to cease production. Due to the armistice in November, the recommendation did not become effective.

"Curtailment is now being studied by the War Production Board and there is some indication that such a procedure will be followed. The future production of road-building equipment may depend on the amount of equipment currently available.

"The conditions are somewhat different now from those of 1918, the annual highway program now being about five times as great. On the other hand, the demand for plant, machine-shop equipment and skilled mechanics is considerably greater. It is certain, however, that if the present supply of road-building equipment is adequate for military needs a large portion of the road-building-equipment industry will be shifted to the production of tanks, guns and other ordnance supplies.

"With a reduced use of civilian automobiles, there wiill be a reduction of highway funds. It is doubtful, however, if this will be sufficient to stop an accumulation due to the curtailed highway program. The danger lies in a general swing to diversion. This is almost sure to happen unless the money is used immediately. Diversion started now would be hard to stop after the war is over. The wisest thing to do would be to have surpluses placed in a highway-fund reservoir which would be extremely valuable in the reconstruction program following the war."

N.S.G.A. *(from page 62)*

phone call from Washington, and I was told that the idea of some of the people higher up to use this group of mining-machinery people as sort of guinea pigs in Washington, seems to still be the idea and they are hoping to try out on this group some ideas they have. They said they would tell me what those ideas would be when I got back to Washington to-morrow. So that answers one of your questions without telling you anything, and I am sorry, but that is all I can tell you.

"In regard to critical materials needed by the industry, we are studying the information sent in by this industry and hope within about two weeks to have a first rough analysis of the needs of the industry. I might say in that connection that I believe every operator in this room, and every maker of mining machinery in this room, should realize that wherever he can modify anything he is using, or modify anything he is making, to get rid of part of or all such critical materials as chromium (which I will use as an example) or nickel, he should do that. And if you happen to have vanadium or tungsten, you had just better start trying to get rid of it to-night, because, irrespective of what amounts of those materials this industry uses, you are going to have to use less of them, because that is true of every industry.

"We are going to have to change our designs, and if we are accustomed to using something that has a life of two years, we are going to have to replace it with something that may have a life of six months or a year, if by changing it we cut down the use of some of these strategic metals, such as chromium, tin, or tungsten, where we can't possibly get enough of them for our total needs. We don't produce any tin at all in the United States. We don't produce very much chromium, maybe 160,000 tons out of 800,000 or more that we need a year. The picture is bad. We have to work together and we have to try to find substitutes, and in some cases we can. I don't mean that we have to make substitutes that will wear out in a week or two weeks, so that we have to take up all our time in changing the worn-out parts, but there are undoubtedly many places where substitution can be made of one type of steel for another type, and I think we have got to sell that idea to the industry through our trade journals and through our trade organizations, and by word of mouth. We have to have all your coöperation in saving those strategic, rare minerals in those places where we will win the war the quickest, and we will just have to replace some of our parts a little more often wherever that is possible, because you can't replace them in a tank or in some implement of warfare.

"Another piece of information that was given me over the telephone is that we have already this morning obtained an amendment to the crude-rubber order, so that it will not affect storage batteries for mine use, used either in locomotives or in permissible lights."

Slag Association Meets

Eighty-five per cent. of the annual tonnage of commercialized iron blast-furnace slag was represented at the 24th annual meeting of the National Slag Association at the Wardman Park Hotel, in Washington, D. C., during a two-day session held during the week of February 8.

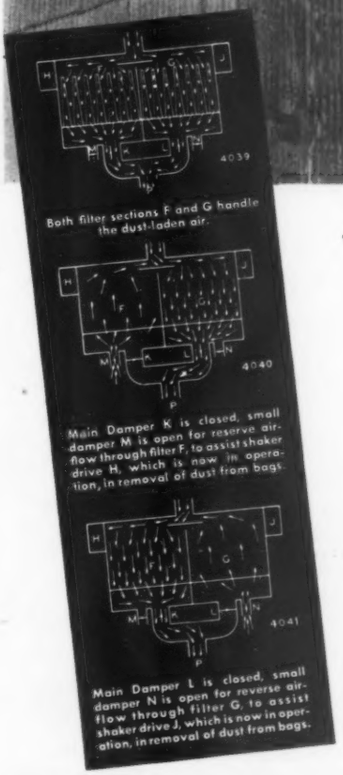
Officers for the coming year were elected as follows:

President: George A. Mattison, Jr., Woodstock Slag Corporation, Birmingham; vice-president: Fred Hubbard, Midland Slag Company, Youngstown; managing director and treasurer: H. J. Love, Washington, D. C.; secretary: T. E. Sheafer, Washington, D. C.

Sly Dust Filter in a cement plant, typical of several thousand Sly installations in many industries for complete dust control. Sly is a 5 to 1 favorite in the cement industry.

SLY DUST CONTROL

MEANS CLEANER PLANTS, BETTER WORKING CONDITIONS


4039
Both filter sections F and G handle the dust-laden air.
4040
Main Damper K is closed, small damper M is open for reverse air-flow through filter F, to assist shaker drive H, which is now in operation, in removal of dust from bags.
4041
Main Damper L is closed, small damper N is open for reverse air-flow through filter G, to assist shaker drive J, which is now in operation, in removal of dust from bags.

"WE'RE very well pleased with this installation; it has meant a much cleaner place and better working conditions for the men," is how the cement company feels about it. The firm has been using Sly Dust Control the past 15 years.

This particular filter is the continuous type. It operates without interruption for shaking, as shown in the diagram at the left. Connected with the fine grinding (ball) mills, it saves the finer particles of cement otherwise wasted as dust.

Responsible for the uncommon efficiency of Sly Dust Control are the flat cloth bag filters. They clean the air completely by filtering the dust out of it. They even get the fine, penetrating dust *invisible to the naked eye.* These bags are held under tension (a patented feature) offering minimum resistance to air flow and assuring *complete* dust removal.

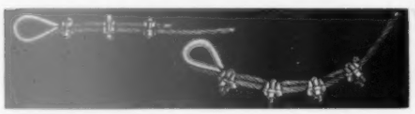
As specialists in dust control let us help you effect the savings possible through proper dust control. Write us fully so that we can give you complete information.

More than 5,000 in successful operation.

THE W. W. SLY MANUFACTURING CO.• 4745 Train Ave., Cleveland, Ohio

SLY
INDUSTRIAL DUST CONTROL

The Laughlin Safety Clip takes the rope in its all-round grip of drop-forged steel. Four flat bearing surfaces grip the rope without weakening or distorting it, delivering 95% of the rope's strength. No finger-pinching U-Bolt bite — bowing and weakening rope below the clip, inviting breakage and accident, or slippage if the U-Bolt goes on backward. Inexperienced help make this last a real hazard.



Save Steel—Save Time—Save Accidents for Full War Effort

There's 25% less steel in a Safety Clip assembly that's as strong as a U-Bolt job. That means more valuable steel for armaments when you buy Safety Clips. Help keep 'em rolling — use the safer, foolproof Safety Clip. And no crimped rope ends to be cut off as wasted metal — rope costs money these days.

And YOU Make These Savings!

No rope bowing or crimping	rope saved
No battered, bent threads	clips saved
No special wrench	tools saved
Bolts on opposite sides	tightening time saved
Can't go on wrong	accidents saved
Fewer clips needed	clips saved
Fewer rope breaks	accidents saved

Distributed Exclusively Through Mill Supply Houses

Look for Laughlin Products in Pit & Quarry Handbook

THE THOMAS LAUGHLIN COMPANY
PORTLAND, MAINE

PERSONAL MENTION

C. C. JONES, president of the Wolverine Portland Cement Company, Coldwater, Michigan has retired after 43 years service with the company. W. FRANK MURRAY, vice-president and plant manager has been made executive vice-president and will direct the company until the board of directors names Mr. Jones' successor.

HANFORD MACNIDER, president of the Northwestern States Portland Cement Company, Mason City, Iowa, former national commander of the American Legion, former Assistant Secretary of War and minister to Canada, has been called to active duty on special assignment in the United States Army. He is a colonel in the infantry reserve.

HENRY H. HOWARD, manager of the engine sales division of Caterpillar Tractor Company, has been called to Washington to take up temporary war-time duties in the War Department, where he will serve as consultant to Colonel J. K. Christmas of the Tank and Combat Vehicle Division.

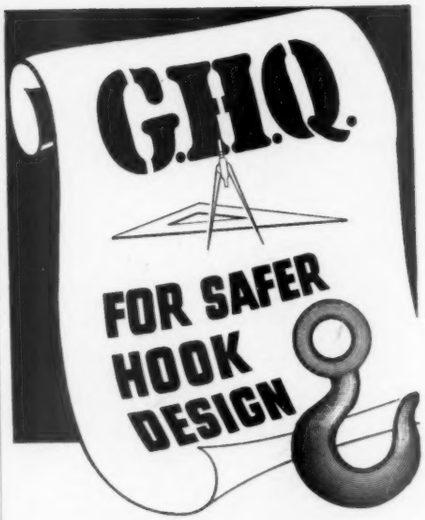
GUY C. BAKER, formerly vice-president and sales manager of the American Aggregates Corporation, Greenville, Ohio, has been made vice-president in charge of sales. C. E. GLANDER is now general sales manager and WALTER POHLMAN succeeds him as Columbus district manager.

WALTER GEIST, vice-president of the Allis-Chalmers Company, is to head a new department, established to coördinate the company's sales policies. The new department will not only formulate and put into effect sales policies, but also correlate and unify selling activities.

D. J. BUTTLES has been appointed western manager of the Cummins Engine Company, with offices in a newly-established. direct factory branch at Salt Lake City.

CARL F. CLAUSEN, formerly Western representative for F. L. Smidth & Company, New York, is now connected with the War Production Board in Washington, D. C., as a cement-industry specialist.

W. C. FRY has retired from the Gresham Sand & Gravel Company, Gresham, Oregon, and the business will continue under the management of H. L. RICE.



Laughlin offers you the most complete line of hoist hooks on the market, in the most varied and fool-proof choice of safety designs — all drop-forged from selected steel and heat treated. Look for the ⓐ, the sign of strength and safety.

Safety Eye Hook **Safety Shank Hook** **Safety Swivel Hook**

The Safety Hook That's Really Safe

A safety latch (as illustrated) is available on all sizes and styles of Laughlin Hoist Hooks. The properly designed, stout-springed safety feature securely traps the sling — no hazard of accidental slipping or jolting off.

THE STRONGEST OF ALL DESIGNS — LAUGHLIN'S CARGO HOOK

Well known to shipping men, this hook is designed for a straight pull. It is as strong as a standard hook twice its weight. The protective tooth prevents hook catching and tipping the load. Hooked lip gives added security.

Available for 2, 4 and 10 ton loads.

Laughlin's Latest Catalog Shows the Complete Line of Laughlin Wire Rope Fittings. Send for it.

Distributed exclusively through Mill Supply Houses

Look for Laughlin Products in Pit & Quarry Handbook

THE THOMAS LAUGHLIN COMPANY
PORTLAND, MAINE

R. A. HUMMEL, president of the Lone Star Cement Corporation has been elected president of the Inter-American Safety Council of New York City. JOHN W. WHITE, vice-president and general manager of Westinghouse Electric International Company, was chosen first vice-president, and W. V. B. VAN DYCK of the International General Electric Company second vice-president.

HENRY VANDERWERP, 58, vice-president of the Medusa Portland Cement Company, Cleveland, and one of the organizers and a vice-president of the Manitowoc Portland Cement Company, Manitowoc, Wisconsin, died suddenly of a heart attack February 9 at Hollywood, Florida. Mr. Vanderwerp was identified with the cement industry for 29 years and resided in Manitowoc from 1923 until 1929, during which time he was instrumental in the formation of the Manitowoc Portland Cement Company. He moved to Chicago in 1929 to become supervisor of sales in Illinois and Wisconsin for the Medusa and Newago Portland Cement Companies and in 1933 went to Cleveland as vice-president in charge of all production activities. He is survived by his wife, two daughters and a son, Harry, resident chemist of a cement plant at Wampum, Pennsylvania. Burial took place in Traverse City, Michigan.

JOHN F. POLLOCK, a director of the National Lime Association for many years and an active executive of the Ash Grove Lime & Portland Cement Company for almost half a century, died February 3.

ARTHUR BYRON SHELBY, 57, vice-president of the Calaveras Cement Company of San Francisco, died February 1. Mr. Shelby spent the earlier years of his life in Dallas, Texas, where he was born, and where he left the employ of the Southern Pacific Company to enter the cement business. He went to California and joined the Calaveras company, in 1927.

ROBERT BRECHIN MASSON, 59, for more than 20 years secretary-treasurer of the Metropolitan Sand & Gravel Company, New York City, died recently of a heart ailment. A native of Scotland, where he attended the University of Glasgow, Mr. Masson came to this country in 1913 and identified himself with an accounting firm. Later he joined the sand-and-gravel company.

GEORGE P. GINGRICH, 72, pioneer concrete-block maker died recently at his home in Middletown, Ohio. Starting in the business in 1904, the plant he founded is now operated by his son Earl Gingrich and known as the Middletown Concrete Block Plant.

FORREST G. ABREW, 66, who retired in 1934 after serving for 20 years as president of the Cement Products Company of Newark, New Jersey, died January 25 after a long illness at his home in East Orange.

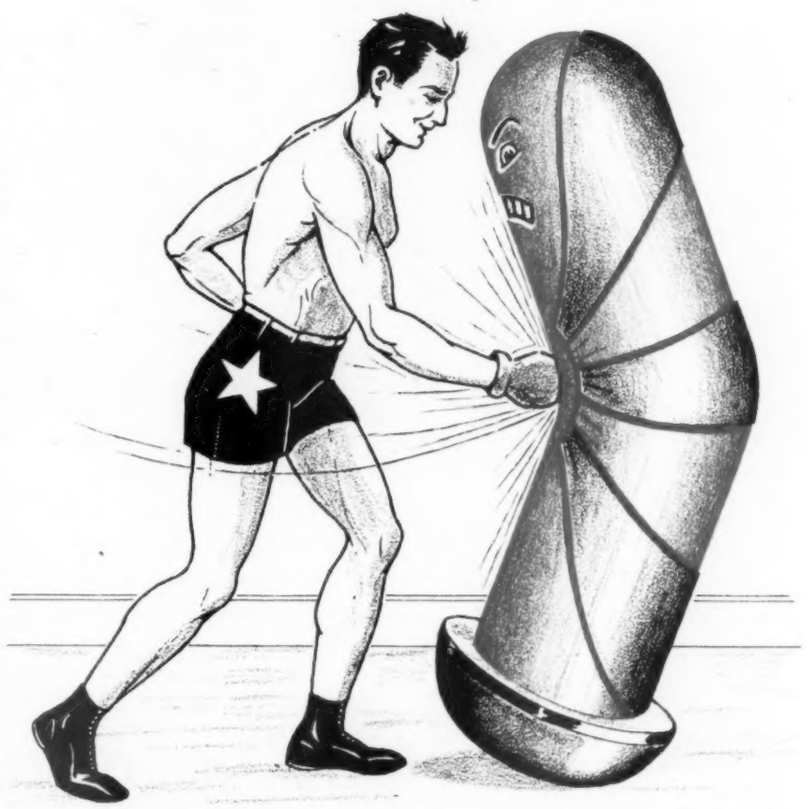
ROBERT A. HALL, 84, owner of slate quarries near Whitehall, New York, died at his home there on February 1.

TRAFFIC News Digest

I.C.C. Reports

Lime.—Docket 28685. Marblehead Lime Company *vs.* St. Louis-San Francisco *et al.* Heard by Examiner L. P. J. Fichthorn. Rates on lime shipped between July 27, 1939, and May 6, 1940, inclusive, from Springfield, Missouri, to Miami and West Palm Beach, Florida,

DYNAMITE *in Every Punch!*

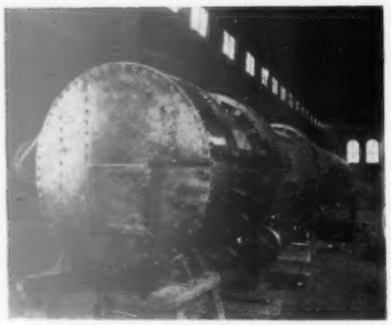


THERE'S A BLASTING PUNCH
in every charge of
NATIONAL EXPLOSIVES
ALWAYS FRESH — 12 to 48 HOUR SERVICE
Write for Information
NATIONAL POWDER COMPANY
ELDRED (McKean County) Pa.

Drying

Gravel
Gypsum
Limestone
Phosphate Rock
Sand
Shale
Stone

Use The "RUGGLES-COLES" Class "XF" Dryer



A Single Shell Dryer Designed for Your Problem.

Parallel or Counter Flow Types Depending Upon Material to Be Dried, Original and Final Moisture.

Submit Your Problem to Us.

HARDINGE
COMPANY, INCORPORATED
YORK, PA., Main Office & Works
NEW YORK, 122 East 42nd Street
CHICAGO, 205 W. Wacker Drive
SAN FRANCISCO, 501 Howard St.
TORONTO, 159 Bay Street

unreasonable to the extent they exceeded $7.28 a net ton, minimum 50,000 pounds to Miami, and $7.11, minimum 50,000 pounds, to West Palm Beach. Reparation with interest was proposed.

Slag.—Docket 28615. John E. Ballinger Construction Company *vs.* Apalachicola Northern *et al. by* the Commission. Report by Commissioner Splawn. Dismissed. Rate of $2.64 a net ton charged on slag, shipped in July, 1938, from Woodward, Alabama, to Port St. Joe, Florida, found applicable. Complainant contended that the applicable rate was $2.53 per ton.

Gypsum Rock.—I. and S. Docket No. 5022. Gypsum rock, from Fort Dodge, Iowa to Prospect Hill, Missouri. By division 3. Proposal of the Burlington and the Fort Dodge, Des Moines & Southern trustees to reduce present all-rail rate of $3.60 per net ton on gypsum rock from Fort Dodge, Iowa to Prospect Hill, Missouri, within switching limits of St. Louis, Missouri, to $2.60 a net ton with no change in present minimum weight. This change to meet barge competition found to create violations of the long-and-short-haul provision of the fourth section, in that higher rates would exist at intermediate points. Schedules which were filed to become effective July 20 and, on protest of the Inland Waterways Corporation suspended until February 20, ordered canceled and the proceeding discontinued. It was noted in the report that at the hearing the respondent's witness testified that their tariff publishing agent had been instructed to clear up the matter of the fourth section violations after the disposition of the I. and S. proceeding, and that apparently the intermediate rates would be reduced to $2.60 a net ton, and that the record did not disclose the effect on traffic of such a reduction in the rates to the intermediate points.

Motor Reports

Salt Lake City, Utah. MC 102783, Sub. 1, Edward J. Huber and Toffee Hauzen, d.b.a. Huber & Hauzen. Common carrier application. Joint board 241. Certificate proposed. Sand, gravel and loose earth, from points in Nevada, within 25 miles of Wendover, Utah, to Wendover, and points in Utah, within 10 miles of Wendover. This to be restricted in that no service be authorized where both origin and destination points are on the Western Pacific Railroad and directly served by this line.

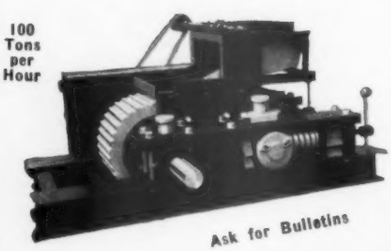
Lake Park, Iowa. MC 100109, Sub. 2, Robert W. Spessard, extension, on sand, gravel and cement. Joint board 146. Certificate recommended. Sand, gravel and cement, between points in

The Cardox-Cliffe System will dislodge accretion from Rotary Kilns at small fraction of cost of complete shut down.

Lime Industry Management & Engineering
Hershey, Pa.

"CRACK DOWN" on Hard Rock
with NEW HOLLAND Super Roll Crusher

100 Tons per Hour



Ask for Bulletins

This "big bruiser" will step up your production and cut down your crushing costs. Patented pulsating feeder doubles the output. Rib shell construction keeps dust at minimum.

Full line of Crushers, Pulverizers, Elevators, Conveyors, Screens, Concrete Mixers, V-Belt Drives, Belting, Motors, Engines, Castings, Power Lawn Mowers and Pick-up Baling Presses.

NEW HOLLAND MACHINE CO., NEW HOLLAND, Lancaster County PENNSYLVANIA

Minnesota on the one hand, and points in Iowa, on the other.

Norristown, Pennsylvania. MC 102885. Santangelo, common carrier application. Examiner Ralph Pierce. Certificate proposed. Road-building materials in dump truck, except brick, tile and cinder block, between Bridgeton, and Norristown, Pennsylvania and points in Marion township, Pennsylvania on the one hand, and points in Delaware and New Jersey on the other.

Bedford, Virignia. MC 103100. Lewis O. Dillon, contract carried application. Joint board 108. Permit recommended. Crude feldspar, from quarries approximately ten miles southeast of Bedford, Virginia, to Bedford, and coal, Bedford to the quarries.

Port Norris, New Jersey. MC 102632. John J. Dagastine, common carrier application. Joint board 67. Certificate proposed. Sand, from Dorchester and Dividing Creek, New Jersey to Philadelphia, Pennsylvania and points in Pennsylvania, within twenty-five miles thereof.

Central Freight Association

Docket 68537. (Shipper's proposal) Limestone, ground or pulverized, unburnt, carload, minimum weight 60,000 pounds. Establish a rate of $2.26 per net ton from Durbin, Ohio to Van, West Virginia.

Docket 69553. (Carrier's proposal) Limestone, ground or pulverized, carload, minimum weight 80,000 pounds. Establish a rate of $2.60 per net ton from Speeds, Indiana to Tallacoosa, Alabama.

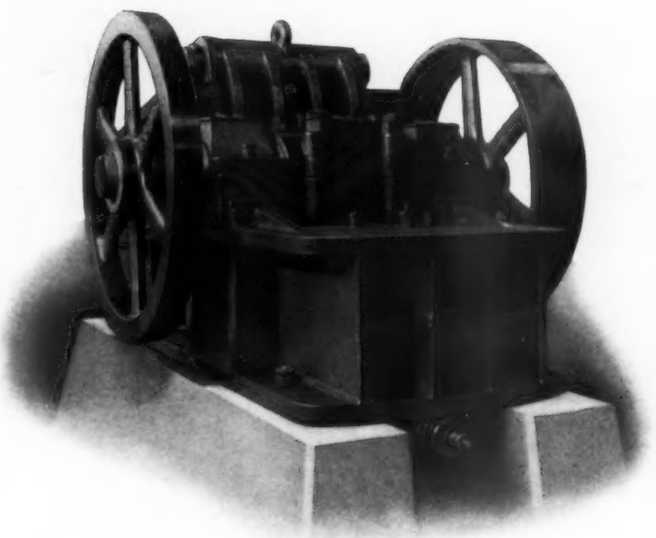
Docket 69557. (Shipper's proposal) Limestone, agricultural, unburnt, in bulk, in open-top cars, carload. Establish on, from Genoa and Martin, Ohio, to Creston, Ohio, $1.16 per net ton; Mansfield, Ohio $1.10; Polk and West Salem, Ohio $1.16. *Via* N. Y. C. (W), Cleveland, Ohio, Erie R. R. and *via* N. Y. C. (W), Martel, Ohio, and the Erie R. R.

Docket 69574. (Shipper's proposal) Gravel, in open top cars, carload. Establish a rate of 94 cents per net ton from Elkhart, to Kingsbury, Indiana *via* N. Y. C. (W), South Bend, Indiana and the G. T. (W).

Docket 69594. (Carrier's proposal) Mineral wool, rock or slag wool, carload. Cancel C. F. A. L. Tariff No. 606, providing storage in transit arrangements at Elwood, Indiana.

Docket 69661. (Carrier's proposal) Lime, common, hydrated, quick or slaked, carload, minimum weights of 30,000 pounds and 50,000 pounds. Cancel commodity rates from Petoskey, Michigan to destinations east of the Ohio-Pennsylvania state line, as published in Item 5500 A to 5550 A of C. F. A. L. Tariff No. 218 M, and indi-

TRAYLOR
TYPE H
JAW CRUSHER



Early last year, a prominent Pennsylvania company installed a medium size Type H, which not only took over the work of two old "other crushers" but OUT-PRODUCED them by 37%, at 3/5 of their size of product (2½" vs. 1½"). And here's the "pay-off"—the old "crushers" used 12c per ton in wearing metal, while the Type H cost only 1-6/10c per ton for metal consumed!

Could ANYTHING be more conclusive? Perhaps you, too, could save enormously by using a Traylor Type H Jaw Crusher. Write us.

SEE BULLETIN 2105

TRAYLOR
ENGINEERING & MANUFACTURING CO.
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY 3416 Empire State Bldg. | CHICAGO 2051 One La Salle St. Bldg. | SALT LAKE CITY 101 West Second South St. | LOS ANGELES 919 Chester Williams Bldg. | SEATTLE 6311—22nd Ave., N.E.

S. C. EQUIPMENT CO., LTD. 551 Howe St., Vancouver, B.C.

MANILA MACH. & SUPPLY CO., INC. Manila and Baguio, P. I.

MAQUINARIA INTERNACIONAL, S.R.L. Av. Francisco I. Madero No. 17, Desp. 214 Mexico, D. F.

Export Department—104 Pearl St., New York City, Foreign Sales Agencies: London, Lima, Sao Paulo, Rio de Janeiro, Buenos Aires, Santiago, Valparaiso, Ourto, Antofagasta, San Juan, P. R.

vidual lines' tariffs of the P. R. R. and of the P. M., etc. Classification basis to apply.

Docket 69663. (Shipper's proposal) Sand, all kinds, and gravel, in open top cars, carload. Establish a rate of $1.10 from Rittenours, Ohio to South Point, Ohio.

Docket 69668. (Shipper's proposal) Stone, crushed, in bulk, in open top cars. Carload. Establish a rate of 85 cents per net ton from Speeds, Indiana to Burns City, Indiana.

Docket 69670. (Shipper's proposal) Lime, agricultural, common, hydrated, fluxing, quick, slaked or fibred. Carload. Establish a rate of 11 cents, minimum weight 30,000 pounds, and 8½ cents minimum weight 50,000 pounds between Alloy and Charleston, West Virginia. *Via* N. Y. C. (W) direct.

Docket 69673. (Carrier's proposal) Limestone, agricultural, unburnt, and agricultural-limestone screenings, in bulk, in open-top cars. Carload. Establish on, to Frazeysburg, Ohio, from Gibsonburg, Ohio, $1.38; Maple Grove, Ohio, $1.38 per net ton.

Fourth-Section Applications

Docket 19613. Filed by J. G. Kerr requesting fourth-section relief to establish rates on lime, carloads, from points in central territory to points on short and weak line carriers in the south. Short or weak line carrier being the grounds for relief.

Docket 19556. Filed by W. S. Curlett and I. N. Doe requesting fourth-section relief to establish rates on limestone, ground or pulverized, carloads, from Florence and West Rutland, Vermont, to points in central territory and extended Zone C in Wisconsin to meet carrier competition.

Docket 19558. Filed by B. T. Jones requesting fourth-section relief to establish rates on cement, lime, or dry building mortar in mixed carloads from points in central territory to points in southern territory to meet market competition. Schedules filed containing proposed rates are B. T. Jones ICC 3504, Supplement 11, and B. T. Jones ICC 3641, Supplement 2.

Docket 19575. Filed by B. T. Jones requesting fourth-section relief to establish rates on sand and gravel, carloads, from points in Indiana to Champaign and Urbana, Illinois to meet truck competition.

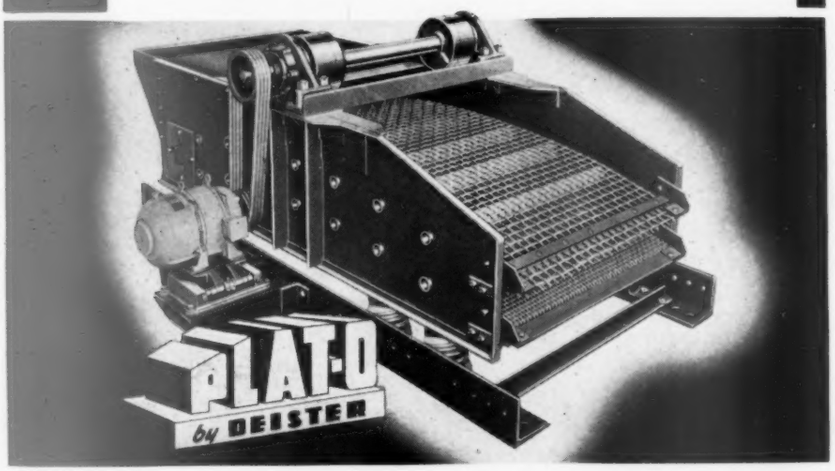
Docket 19576. Filed by B. T. Jones requesting fourth-section relief to establish rates on sand and gravel, carloads, from Riverton, Indiana to Champaign, Illinois to meet market competition.

8 WAYS TO SAY — There's Profit in using PLAT-O by DEISTER

One aggregate producer may say that it's the Deister PLAT-O Vibrating Screen's opposed elliptical throw — its low headroom, accurate grading and high capacity — that accounts for its consistent ability to turn out more tons at a lower cost per ton. Another may give the credit to PLAT-O's powerful, positive high speed. Both are right because there are *eight ways* to account for PLAT-O's superior performance.

The others include: Its adjustable stroke . . . its oil (not grease) lubrication . . . its automatic screen cloth tension and easy change of each deck independently . . . its fully cushioned vibration . . . its simple, two-bearing construction . . . and its low power requirements. All of these are outstanding features of Deister PLAT-O Vibrating Screens which will assure you of more profits on your job.

DEISTER MACHINE CO. FORT WAYNE, INDIANA



LABOR DECISIONS

Contracting

Allen v. Moe, decided by the U. S. District Court, District of Idaho, Northern Division, May 31, 1941; reported at 39 Fed. Supp. 5.

The defendant employer contracted to produce and deliver logs to a buyer in another state, and the plaintiff was employed to repair and maintain equipment used in fulfilling the contract. The Court holds that the employee is engaged in the production of goods for interstate commerce, within the coverage of the Fair Labor Standards Act of 1938. "If such were not the case, then one who manufactures goods and shipped them in interstate commerce could avoid the application of the Fair Labor Standards Act by entering into a contract with another to employ men to produce logs to be delivered by them and thereby indirectly create a situation placing them beyond the operation of the Act."

★ ★ ★ ★ ★

Insure the future of America . . .
Buy Defense Bonds

★ ★ ★ ★ ★

The contract wage was $165 per month, amounting to 90c. per hour, and during the period concerned the employee worked in overtime employment 790 hours. Overtime pay is claimed at the rate of $1.35 per hour. To this the Court rules that "the Fair Labor Standards Act does not prohibit parties from contracting with reference to labor provided compensation to be paid is not less than the minimum and within the scale fixed by the act" (citing cases).

Reinstating Strikers

Wilson & Co., Inc. v. National Labor Relations Board, decided by the U. S. Circuit Court of Appeals, Seventh Circuit, June 24, 1941; reported at 120 Fed. (2d) 913.

The National Labor Relations Board held that the employer concerned had engaged in unfair labor practices in the making of certain statements to striking employees concerning the futility of the strike and the advisability of abandoning it, and threatening the loss of jobs and the closing of the plant if the strike were not abandoned, and in refusing to reinstate the striking employees. The court, however, holds that a company letter complained of demonstrates the company's "cautious attitude and desire to deal fairly with its striking employees", and that various statements by supervisory employees "must be treated as isolated statements contrary to the proved policy" of the company. The strike is found not to have been caused by any unfair labor practice, and was attended by unlawful violence. The company had the right to hire new employees to replace striking employees and to promise them permanent employment, and its offer to rehire as many employees as it could find place for, reserving to itself the right to decide which of those employees who had engaged in violent conduct it would not take back, is held to have been within its rights. The board's cease-and-desist order, accordingly, will not be enforced.

Subpoena

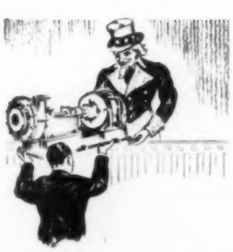
Cudahy Packing Co. v. Fleming, decided by the U. S. Circuit Court of Appeals, Eighth Circuit, October 11, 1941, rehearing denied November 3, 1941; reported at 122 Fed. (2d) 1005.

The employer involved in this case operates two plants in Minnesota, one admittedly engaged in interstate commerce, the other claimed to be engaged in intrastate commerce only. The acting regional director of the Wage and Hour Division, claiming to have reasonable grounds to believe that the company was violating the Fair Labor Standards Act of 1938, directed an in-

SAND AND GRAVEL
from bank to bin in 3 min.

Here is sand and gravel production with remarkable coordination and efficiency . . . the material dredged from the bank, divided into two sizes of sand and three sizes of gravel, cleaned and stacked into piles and bins . . . all within a few minutes!

A Morris Hydraulic Dredge is the heart of the plant, steadily cutting into the deposit and continuously delivering the material to the washer and sorting screens. This operator, like hundreds of others all over the country, has found that a Morris Dredge means speedy and economical sand and gravel production.



WE HAVE ENLISTED "FOR THE DURATION"

We have placed at the disposal of the Government all our facilities that might be of use in the national war effort. But our remaining facilities are at your service, and also the advice of our engineers to help you secure best results from your present equipment and to plan for your future needs.

MORRIS MACHINE WORKS — MORRIS ESTABLISHED 1864 — BALDWINSVILLE NEW YORK

CENTRIFUGAL PUMPS

vestigation to be made at both plants, under Section 11 of the act. The company refused to allow access to its records at either plant unless the Wage and Hour Division would advise the names of any employees concerning whom complaint had been made, when it would produce the record as to such particular employees only. The acting regional director thereupon issued a subpoena requiring the company to appear and produce the records of wages and hours of all employees at both plants, and upon the company's refusal to obey, the Administrator applied to the U. S. District Court for an order to compel compliance. An order requiring the company to comply was appealed.

In this decision on that appeal the court holds, against the employer's contentions, that such litigation may be instituted by the Administrator, the power conferred upon the Attorney General under Section 4(b) of the act to direct and control all such litigation being permissive and not mandatory; that the subpoena was not void on the ground that it was signed by the acting regional director, and not by the Administrator personally; that "the motive of an administrative officer in undertaking lawful action within the sphere of his valid powers and duties can not be made the subject of judicial inquiry"; and that all of the records required to be produced were clearly records which the Administrator or his designated representatives were entitled to inspect under Section 11(a) of the Act in the situation presented.

"Where an industry is subject to the Fair Labor Standards Act, the Administrator is entitled, under Section 11(a) of the act, to inspect the records of all its employees, both non-exempt and exempt," says the court. "Similarly, where an employer is engaged in operating more than one plant or establishment, and seeks to claim that a part of such plants is subject to the act and another is not, there can be no possible question as to the right of the Administrator to inspect the shipment records of all of them, in order to determine the scope of the operations of each and the relationship between them. Indeed, in any industry subject to the act, the Supreme Court has declared that "The requirement for records even of the intrastate transaction is an appropriate means to the legislative end.'"

Computing Overtime

Graves v. Armstrong Creamery Co., decided by the Supreme Court of Kansas, November 8, 1941; reported at 154 Kan. 365.

The only question in controversy in this case, which was a suit under the Fair Labor Standards Act of 1938, was the computation of the "regular rate" at which the plaintiff was employed, for the purpose of determining unpaid overtime compensation. The employee concerned had a fixed monthly salary or wage covering no fixed or agreed number of hours of work, and the number of hours he worked fluctuated from week to week. The employee contended that the regular hourly rate should be considered to be the weekly wage divided by the number of hours permitted by the act without overtime (at the period concerned, 42 hours). That contention, however, was rejected by the court, which approves the method of computation announced by the Administrator in Interpretative Bulletin No. 4 and other releases of the Wage and Hour Division. Under that method, "where there is no regular number of hours per week fixed by agreement or custom, the regular hourly rate is the weekly wage, or the monthly wage reduced to a weekly wage, divided by the total number of hours actually worked in the week" (from Employers' Digest of Wage-Hour Law), "and must be determined for each week involved by the number of hours actually worked."

Balance! That's why DIAMOND Screens Outperform

12 Standard sizes from 2'x5' to 4'x14' and in single, double, 2½ and three deck models. Other sizes on order.

Scalping screens. Combination scrubber screens. Shaker screens. Drag washers.

DAILY maximum output at low production costs demands a vibrator that performs smoothly and efficiently—that operates with a true circular motion, forcing the material evenly over the screen and downward to the delivery end . . . DIAMOND vibrating screens are properly balanced. And the *improved* 1942 models have features that demand careful consideration . . . Diamond Engineers will gladly cooperate with you in solving your crushing and screening problems, and at no obligation . . . JAW CRUSHERS, ROLL CRUSHERS, SCREENS, CONVEYORS, QUARRY PLANTS, PORTABLE PLANTS, FEEDERS, HOPPERS, BINS.

ASK US for information about any of these products, or for the services of our engineering staff. WRITE TODAY.

DIAMAHR

DIAMOND IRON WORKS, INC.
ESTABLISHED 1868

Drop Shipments Valid

Drake v. Hirsch, decided by the U. S. District Court, Northern District of Georgia, Atlanta Division, August 8, 1941; reported at 40 Fed. Supp. 290.

The petitioner in this case was a truck driver who sued for unpaid minimum wages and overtime and additional amounts under the Fair Labor Standards Act of 1938. His deliveries were for the most part deliveries of goods to local customers from stock in his employer's warehouse; original packages received by the employer from outside the state were opened and the merchandise distributed to warehouse stock. Under such circumstances, the court holds, the driver would not be covered by the act. However, the driver also delivered drop shipments representing goods shipped by factories outside the state, delivered to customers in original packages after perhaps a short temporary delay in the employer's warehouse. While these interstate shipments were not large in volume, and constituted only a small part of the employer's business, they were nevertheless substantial in amount and not isolated transactions, and on account of such deliveries the truck driver is allowed to recover under the Fair Labor Standards Act. Two ledger clerks whose duties were to keep records of accounts receivable of local customers intervened in the suit, but the court holds that they are not within the coverage of the act.

"Executive" Defined

Devoe v. Atlanta Paper Co., decided by the U. S. District Court, Northern District of Georgia, Atlanta Division, July 31, 1941; reported at 40 Fed. Supp. 284.

An employee who sued in this case for unpaid minimum wages and overtime and additional amounts, under the Fair Labor Standards Act of 1938, was employed as a foreman. It was his duty to manage the storage, handling and receiving department, to supervise and direct other employees, and to hire and fire employees in that department. His duties were exactly those defined by the Administrator of the Wage and Hour Division as the duties of an "employee employed in a *bona fide* executive capacity," exempt from the act, except that he was paid less than the $30 per week also specified in the Administrator's definition (subsequently changed to $200 per month).

The court holds that the power to define "employee employed in a *bona fide* executive capacity" delegated in the act to the Administrator is constitutional, but that the Administrator has no power to add to the definition an element which is not a real incident to executive work. The fact that an ex-

The "Toughest Steel Known" Is Indispensable in War as in Peace

As much as ever, it is essential to use 13% manganese steel castings, for real economy and continuous production, in the heaviest shock and abrasion services. Its use saves metal because, under greatest stress and wear, one ton equals in performance, on the average, ten tons of ordinary steel. Minimum maintenance effort, a natural result, releases manpower as well, equally important to war production.

Manganese Steel, "The Toughest Steel Known," is so well known to quarry and sand pit operators that anything else for crusher jaws, mantles, concaves, roll shells and pulverizer hammers is seldom seriously considered. There are many other equipment wearing parts, however, not so widely used, that should be made of manganese steel in the interest of industrial economy and the country's war effort.

Grizzly bars, screen plates, gears and pinions, elevator buckets and chain are some of the "cheaper to replace often" parts that should be made of tough, wear-hard 13% manganese steel. Be sure that it's Amsco manganese steel and avail yourself of the research facilities, X-ray, and foundry experience that insure the soundest metal and the longest service.

The money savings and more continuous equipment operation given for 40 years to quarry and pit operators by manganese steel crusher and power shovel parts can also be obtained from other parts not now so universally used in this metal by the rock products industry. Gears, car wheels and wire rope sheaves are just a few of such applications. You save money for yourself while you save metal and man-power for Uncle Sam.

Amsco
AMERICAN MANGANESE STEEL DIVISION
OF THE AMERICAN BRAKE SHOE & FOUNDRY CO.
Chicago Heights, Illinois

Manganese Steel Castings for shocks and abrasion.
Chromium-Nickel Alloy Castings for heat and corrosion resistance.
Power Shovel Dippers. Dredge and Industrial Pumps.
Welding Materials for reclamation and hard-surfacing.

FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO. OFFICES IN PRINCIPAL CITIES

ecutive may work for less than $30 per week or even $1 per year, says the court, does not alter the fact that he is an executive. Since in all other respects the employee concerned was admittedly within the definition of "executive," the coverage of the act and that the suit court rules that he is not within the must be dismissed.

Waiver of Rights

Fleming, Administrator, etc., v. Warshawsky & Co., decided by the U. S. Court of Appeals, Seventh Circuit, November 27, 1941.

The defendant company consented to a judgment requiring it to pay unpaid minimum wages and additional amounts under the Fair Labor Standards Act to its employees. Certain employees voluntarily and without coercion (according to the employer), relinquished their claims. The U. S. district court (in contempt proceedings) held that the judgment was not violated by the failure to pay such claims, but the appellate court in this appeal rules that the obligation to make such payments is not removed by the employees' waivers.

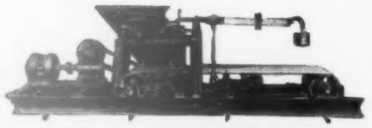
The objectives of the act, says the court, "were the elimination of labor conditions detrimental to the maintenance of the minimum standards of living necessary to the health, efficiency and general well-being of employees, and the eradication of the burdens on commerce caused by such sub-standard labor conditions," and either waivers in advance of employment or waivers of back pay for past employment ignore the statutary requirements and the purposes of the legislation. Violation of the judgment could not be avoided by settlements, even though voluntary and without coercion, and the employer was in contempt of court for failure to comply with the judgment.

Back Pay Award

Indianapolis Power & Light Co. v. National Labor Relations Board, decided by the U. S. Circuit Court of Appeals, Seventh Circuit, September 15, 1941, rehearing denied October 9, 1941; reported at 122 Fed. (2d) 757.

This case involved, among other things, the power of the National Labor Relations Board to award back pay independently of reinstatement, and the court holds that it has that power. The question was raised in the case of *Phelps Dodge Corp. v. Labor Board,* 313 U.S. 177, 61 S. Ct. 845, 133 A.L.R. 1217, and although the Supreme Court did not pass upon the question expressly, "the order appears to be within the power of the board as defined by that decision, and no doubt was intended to be included among the other minor objections to the board's order, which the court deemed it unnecessary to discuss, agreeing with the disposition of them by the court below." In this case the court affirms an order requiring payment of back pay to an employee who was discriminatorily discharged and who was not ordered reinstated because he was otherwise employed when the order was made.

PROPORTION ACCURATELY BY WEIGHT



WITH POIDOMETERS

For over Twenty-Five Years POIDOMETERS have been PROPORTIONING RAW AND FINISH Materials in the leading CEMENT PLANTS of the world.

Write for Catalog No. 5 and get Complete profit-producing facts!

SCHAFFER POIDOMETER CO. 2828 Smallman Street PITTSBURGH, PA.

PERFORATED METAL SCREENS

FOR SAND, GRAVEL STONE, ETC.

Manufactured exactly to your specifications.

Any size or style screen, in thickness of steel wanted with any size perforation desired.

We can promptly duplicate your present screens at lowest prices.

Prompt Shipment

CHICAGO PERFORATING CO.
2435 W. 24TH PLACE CHICAGO, ILL.
Telephone CANAL 1459

OCCUPATIONAL DISEASES and the LAW

Fumes

Martin v. Tubize-Chatillon Corp., decided by the Court of Appeals of Georgia, Division No. 2, December 4, 1941, rehearing denied December 19, 1941; reported at 17 S.E. (2d) 915.

The controlling question in this case was whether the allegations of the plaintiff's petition showed that the plaintiff's injuries from exposure to sulphuric-acid fumes resulted from an occupational disease (in which case there could be an action for damages under Georgia law) or whether they resulted from an accidental injury compensable under the Georgia Workmen's Compensation Act (in which case there would be no right of action for damages). The court holds that the allegations of the petition "show a disease caused by and incident to the plaintiff's working in a factory where rayon was being manufactured and where the air was filled with sulphuric-acid fumes, which factory was not properly ventilated so as to prevent the inhalation of such fumes by those working therein. Under the allegations of the plaintiff's petition as amended the jury would be authorized to find that the plaintiff's exposure to sulphuric acid caused his injury and that if the defendant's plant had been properly ventilated, or if the defendant had provided the proper precautionary measures, such injury might not have been sustained." The petition as amended is therefore held to have set out a cause of action, and a lower court decision to the contrary is reversed.

Disease or Accident?

Dobbs v. Bureau of Highways, et al., decided by the Supreme Court of Idaho, December 5, 1941, rehearing denied January 7, 1942; reported at 120 Pac. (2nd) 263.

A workman claimed compensation on the ground of combined silicosis and

tuberculosis allegedly resulting from his occupation as operator of a rock crusher. The Idaho Industrial Accident Board awarded compensation on the ground that his disability was caused by accidental tuberculosis, and the court, affirming the award, rules that is was the board's duty to determine whether the worker was afflicted with disabling or non-disabling silicosis or accidental tuberculosis. "The onset of the tuberculosis herein, according to the evidence, was brought about by the action of silica dust, which was sudden and unexpected and therefore falls clearly within the doctrine announced" in various cases dealing with accidental injuries. The distinction between the condition amounting to an occupational disease and where it is accidental "is the suddenness of the onslaught." The fact that the worker was afflicted with incipient tuberculosis or was predisposed or susceptible to tuberculosis does not bar compensation, under Idaho cases.

Hernia

Kniat v. Industrial Commission et al., decided by the Supreme Court of Illinois, November 18, 1941; reported at 37 N.E. (2d) 810.

The widow of a workman (who died of post-operative pneumonia following a hernia operation) claimed compensation under the Illinois Workmen's Occupational Diseases Act (Illinois Revised Statutes, 1941, Chapter 48). The arbitrator found that the workman had slowly and insidiously developed a hernia due to periodic strains while lifting various articles of varying weights in the course of his employment over a period of years, and that such hernia constituted an occupational disease as contemplated by Section 6 (Paragraph 172.6) of the act. That decision was set aside by the Industrial Commission. On appeal to the Circuit Court of Cook County the commission's decision was reversed, and the commission was ordered to pay compensation in accordance with the arbitrator's award. In this further appeal, the Supreme Court in turn reverses the decision of the court below, sustains in effect the decision of the commission, and rules that such hernia is not an occupational disease compensable under the act.

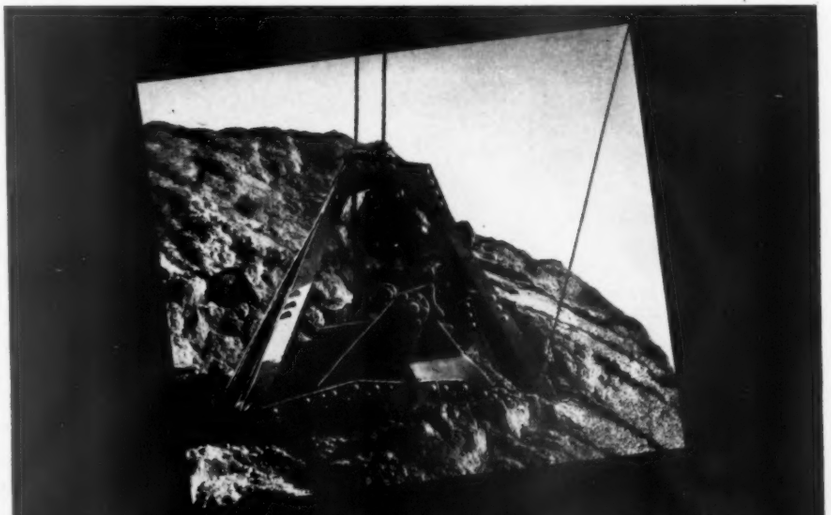
In order to be compensable as an occupational disease, according to the Supreme Court's ruling, the statute requires the presence of three elements: (1) The disease must arise out of the employment; (2) it must arise in the course of the employment; and (3) it must not be an ordinary disease of life to which the general public is exposed outside the employment, unless it follows as an incident of an occupational

THE MIDDLE FELLOW
OPERATES HIS PLANT WITH
SECO
VIBRATING SCREENS

We met him at the Cincinnati Convention, just bubbling over with enthusiasm for his Seco Screen. If you have any screening to be done, consult us.

We'll Put a Smile on Your Face, Too

SCREEN EQUIPMENT CO., INC.
9 LAFAYETTE AVE., BUFFALO, N. Y.



YOU CAN BANK ON A BROWNHOIST BUCKET

Industrial Brownhoist buckets represent the last word in good design and construction. Light weight is combined with unusual strength. Rope wear is reduced to a minimum. Because of the clean, deep bites they take, hand shoveling is practically eliminated. Standard buckets on hand ready for immediate delivery. Write for further facts.

INDUSTRIAL BROWNHOIST
BAY CITY, MICHIGAN • DISTRICT OFFICES: NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO

POWER and ECONOMY.. YOU GET BOTH in PORTER DIESELS

● Porter Diesel Electric Locomotives are *proving by performance* that they are tops on the toughest haulage jobs. Though ruggedly built and amply powered for the heaviest loads, Porter Diesels are also designed for operating and maintenance economy. Get an unbiased recommendation on the size and type of locomotives best suited to your particular requirements.

ONLY PORTER BUILDS A
COMPLETE LINE OF
INDUSTRIAL LOCOMOTIVES

H. K. PORTER COMPANY, INC.
PITTSBURGH • PENNSYLVANIA

LOADER VALUE

is in what it costs per yard per 100,000 yards. On that basis a HAISS will prove out to cost you less than anything else we know of . . . Write for catalog.

2-3-5 and 8 YD. CAPACITIES

HAISS QUALITY EQUIPMENT FOR 50 YEARS 1892 1942

GEO. HAISS MFG. CO., INC.

HAISS

142nd Street & Rider Avenue, New York, N. Y.

disease. "All three elements must be present, and it is of no avail to a claimant to show that the requirements of Paragraph 2 have been met—that is, that the disease was caused by the employment—if either of the other elements is lacking. In other words, it is not sufficient for a claimant to show a chronic hernia arose out of the employment, because of a repeated strain over a period of years. He must also show that such hernia is not an ordinary disease of life to which the general public outside the employment is exposed, unless it followed as an incident of an occupational disease. It is not contended here that the hernia was an incident of an occupational disease. . . . There is no doubt that hernia is an ordinary disease of life to which the general public is exposed. People in all walks of life have hernias, and the causes of them are so numerous that it can not be said they are peculiar to any employment. . . . Hernia is as much an ordinary disease of life to which the general public is exposed as is tuberculosis."

Silicosis

J. I. Case Co. v. Industrial Commission et al., decided by the Supreme Court of Illinois, November 18, 1941; reported at 37 N.E. (2d) 821.

The workman suing for compensation in this case was employed at one time as a miller and sand blaster, and at a later time as a janitor, and the Supreme Court finds the evidence adequate to support successive findings by the administrator, the Industrial Commission and the Circuit Court that he was exposed to silica dust, and, hence, to the hazard of silicosis, in sand pits or bins and in the foundry. The Industrial Commission held that he was completely disabled and awarded him compensation and a life pension under Section 8 (f) of the Illinois Workmen's Occupational Diseases Act (Illinois Revised Statutes, 1941, Chapter 48, Paragraph 172.8). The Circuit Court, however, held that the award was "against the weight of the evidence," and awarded compensation for temporary total incapacity for work during a limited period. That decision is reversed, and the commission's award upheld, in this further appeal to the Supreme Court.

The Supreme Court holds the evidence "sufficient to sustain the decision of the commission that Girardi was not only exposed to but contracted an occupational disease arising out of and in the course of his employment. Where the evidence is merely conflicting as here, and the commission's finding is not contrary to the manifest weight of the evidence, its decision should not be disturbed." If after an award of complete disability a worker

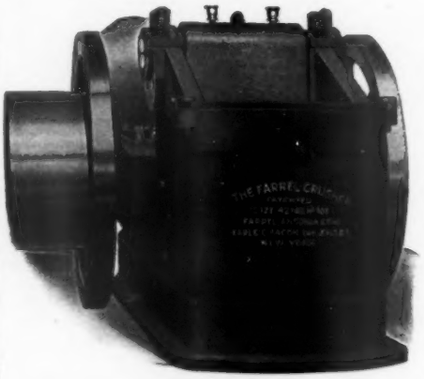
IT COSTS NO MORE — TO USE THE BEST

REPLACE WITH
"Indian Brand"
MANGANESE STEEL
LONG LIFE
ABRASION
RESISTING PARTS
FOR
QUARRY, ROAD,
DREDGING,
AND
MINING MACHINERY

The Frog, Switch & Mfg. Co. CARLISLE, PA.
ESTABLISHED 1881

FARREL BACON
CRUSHERS

Complete plants designed and equipped, including Screens, Elevators and Conveyors. Machinery for Mines and Rock Quarries, Sand and Gravel Plants. Engineering Service.



EARLE C. BACON, Inc.
17 John St. New York, N. Y.

becomes able to work, the award can be modified pursuant to the statute. The statutory provisions "clearly disclose that the General Assembly did not employ the words 'complete disability' in paragraph (f) of Section 8 as synonymous with a perpetual and irremediable incapacity for work. Manifestly, neither the Industrial Commission nor the courts are warranted in speculating" on the worker's disability pursuant to the time of the hearing.

NEW MACHINERY and SUPPLIES

• Locomotives

The H. K. Porter Company, Pittsburgh, is building two types of industrial locomotives especially suited for use in operating where curved track and narrow clearances are encountered. Because operation of these locomotives is unaffected by the present rubber shortage, and because they can assist in fuel conservation by hauling comparatively greater loads on a given amount of fuel, these locomotives will be of particular significance to the quarrying industry at the present time.

One locomotive is of the diesel mechanical type, developing 100 horsepower and speeds up to 15.6 m.p.h. Powered by an International Harvester PD-80 Diesel engine of 6 cylinders, this locomotive weighs 12 tons in working order and is 8 feet 3 inches wide, 7

Diesel-mechanical locomotive.

feet 6 inches high, and 12 feet long over bumpers. Construction differs from the standard line of Porter Diesels in the method of driving. Instead of employing standard forged steel side rods the locomotive is driven by means of a heavy-duty chain, thus eliminating the overhang of side rods. This feature, together with the fact that the wheelbase is only 4 feet 9 inches, simplifies negotiation of extreme clearances and sharp curves. For strength, frames and bumpers are constructed of heavy structural steel, welded together and strongly braced lengthwise and crosswise. A 5-speed International Harvester transmission and dry-disk clutch assure the user of smooth operation on grades.

★ ★ ★ ★ ★

No effort is too small. . . .

Buy a Defense Stamp to-day

★ ★ ★ ★ ★

TRADE MARK
KEYSTONE
REGISTERED U. S. PATENT OFFICE

MODEL 51

BLAST HOLE DRILL

WELDED and RIVETED

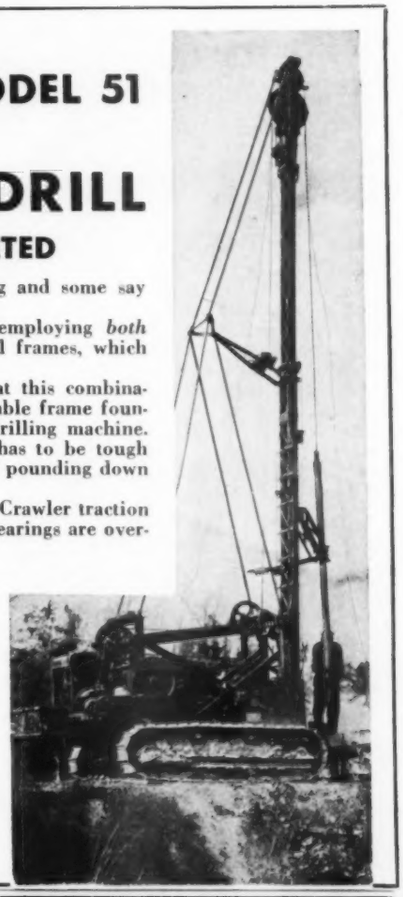
In steel fabrication some say one thing and some say another.

Keystone by-passes the argument by employing *both* methods in the construction of well drill frames, which are welded *and* riveted.

As a matter of fact we have found that this combination gives the best, most rugged and durable frame foundation that can be designed for a well drilling machine. And the frame under a blast hole drill has to be tough to stand the never-ending stress and jar of pounding down six-inch holes in hard rock.

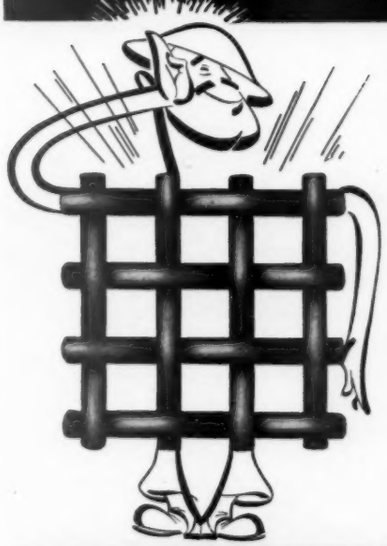
Other details of the design of Model 51-Crawler traction quarry drill are in keeping. Shafts and bearings are oversize. Structural members are of ample form and section dimensions. Bearings are of anti-friction type. The length and character of the drilling stroke are adjustable to give greatest efficiency. Model 51 is a modern, stream-lined rock borer — the latest product of an old and well known shop.

You will want to know more about it. Ask for bulletin BD-142.



KEYSTONE DRILLER COMPANY
Beaver Falls, Pa.

ROEBLING
Abraso Screen



IT'S UNIFORM—
under Roebling control from start to finish!

Yes, the uniform quality and performance of Roebling Abraso Screens starts back in the steel mill. First, experienced screening men select only those melts of steel—from Roebling's own furnaces—that they know have the highest degree of resistance against shock and abrasion.

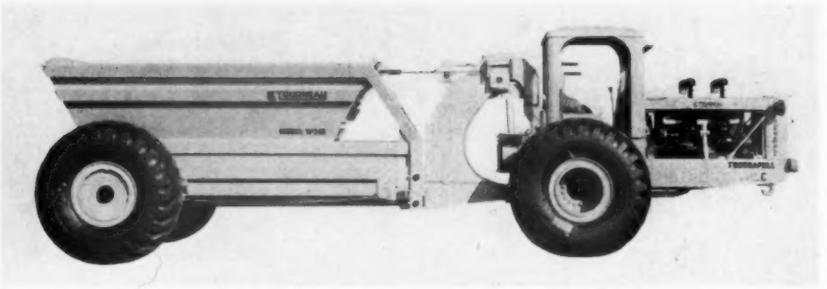
Then, through every stage of rolling and drawing, the steel is rigidly checked — to standards established by Roebling's years of wire-making experience. The result—steel wire that can be uniformly toughened in heat-treating furnaces, accurately meshed on our fabricating machines—to assure the utmost efficiency and service in sizing, grading and cleaning work.

JR ROEBLING

JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY · Branches and Warehouses in Principal Cities

One of the saddle-tank engines.

The second locomotive is of the saddle-tank steam type, incorporating several features which make it adaptable for service in quarries. It is 18 feet 3 inches long over bumpers and weighs 21 tons in working order. Four 31-inch drive wheels, with a wheelbase of only 5 feet, greatly increase this locomotive's versatility in operating over sharp curves and rough track.



Material-handling unit of 17 cubic yards capacity.

• Tractor-Trailer

In order fully to utilize the power and speed of the Super C Tournapull, R. G. LeTourneau, Incorporated, introduces the W210 Tournatrailer with a heaped capacity of 17 cubic yards. This unit has been designed with flared side and end walls for quick, accurate loading by drag-line or shovel.

The W210 Tournatrailer is powered by the 150 horsepower Super C Tournapull for fast pickup and travel, quick spotting and maneuvering. Four forward speeds: 2.6, 4.4, 8.1 and 14.3 m.p.h. and reverse of 2.2 m.p.h. give travel speeds for all job conditions.

Other features of the W210 Tournatrailer are: patented, self-cleaning, sliding bowl that gives end-dumping or spreading in layers from an inch to 36½ inches in depth; 21-inch external hydraulic brakes, lined with 300 square inches of woven braking surface for positive stopping; special analysis steel and box-beam construction for strength with light weight; cable operated from a LeTourneau double-drum power-control unit; interchangeable on the same power unit and Super C Tournapull with LP Carryall.

• Separator

William H. Allswede of Hersey, Michigan, inventor of the well-known Allswede Scrubber, has patents applied for on another unit which promises to solve as many tough cleansing problems as his scrubber.

The new unit is called the Allswede Hydraulic Separator. While the scrubber removes clay balls, soft stone, shells, mud, etc., from gravel, the new separator removes light foreign matter such as sticks, bark, driftwood, shale, etc.

Gravel containing light, deleterious matter of any sort is fed into a feed box. It then falls through a 10-inch pipe, passes into the 24-inch pipe and through it to an elevator boot.

In the meantime, the proper amount of water (about 1,000 gallons per minute) is introduced through a 6-inch spray pipe, its only outlet being up through and over the top edge of the 24-inch pipe. A valve controls the volume of water to a point where it carries all light material up and out of the 24-inch pipe to a refuse-discharge box. Clean gravel is picked up by the elevator which is equipped with perforated buckets and discharged.

Like the Allswede Scrubber, the F. M. Welch Engineering Service has the selling and the manufacturing rights on the new separator.

Something radically new in the making of spectacle-type goggles easier and more comfortable to wear is claimed for the new "comfort-bridge" feature announced by the Chicago Eye Shield Company. The bridge is described as a single unit, molded out of non-flammable plastic material including wide bearing "jumbo" pads which distribute the weight evenly and float the frame without undue pressure across the bridge of the wearer's nose. Designed for flexibility, both the bridge and pads become self-adjusting to varying nose widths.

• Babbitt Metal

A new babbitt metal for bearings subject to high pressures and temperatures has been developed by Magnolia Metal Company. This metal, known as Power Nickel Genuine Babbitt, has a tensile strength of 17,500 pounds per square inch, a yield point of 65,000 pounds per square inch, a Brinnell hardness of 27, and its pouring temperature ranges from 950 to 1,000 degrees.

The high softening and melting temperatures make the metal resistant to extreme local heat. Its unusual strength makes the metal adapted to heavy bearing loads. The nickel treatment gives the metal a hard glossy surface. desirable for generators, motors and other high-speed application.

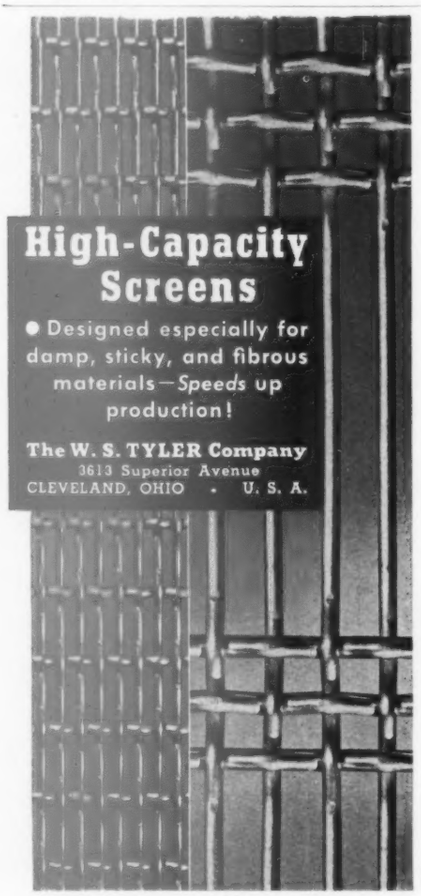
Additional information can be obtained by addressing the manufacturers, Magnolia Metal Company, Elizabeth, N. J.

★ ★ ★ ★ ★

For the freedom of humanity. . . .

Buy a Defense Bond

★ ★ ★ ★ ★


High-Capacity Screens
• Designed especially for damp, sticky, and fibrous materials—Speeds up production!
The W. S. TYLER Company
3613 Superior Avenue
CLEVELAND, OHIO • U. S. A.

A Positive and Precise Check on Materials in Transit

BE SURE OF YOUR PRODUCTION FIGURES in belt-conveying bulk materials.

The MERRICK Weightometer provides an automatic, continuous and accurate record of sand, gravel, ores and similar products in transit.

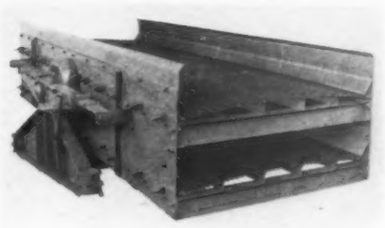
It's durable, easily installed and economical to operate.

Write for Information

by **Merrick Scale Mfg. Co.**
Passaic, New Jersey

• Screen X-Rayed

The Robins Conveying Belt Company, Passaic, New Jersey has just issued a new Bulletin No. 115 which illustrates and describes in unusual detail its well-known Robins-Gyrex screen. The bulletin contains a unique X-ray section which allows the reader actually to



build up a complete screen. There is also a large three-page spread in color containing many interesting installation views of these screens in varied applications.

The bulletin also contains valuable technical data on the selection and use of vibrating screens as well as complete dimension tables for the various standard sizes and styles available. Copies are available on request from the manufacturer.

• Morris Appoints Saks

The directors of Morris Machine Works, Baldwinsville, New York, manufacturer of centrifugal pumps, hydraulic dredges and steam engines, announce the election of Stuart J. Saks as president. He has been associated with the company for the last two and one-half years as assistant to the president.

pages. Concrete Transport Mixer Company, St. Louis.

CONCRETE . . . HOW MANY FACTORS OF SAFETY DOES IT NEED? 12 pages. Scientific Concrete Service Corporation, Washington, D. C.

ERNST MAGIC DRUM AND BARREL CARRIER. 6 pages. Ernst Magic Carrier Sales Company, Buffalo.

LA PLANT-CHOATE EQUIPMENT FOR USE WITH CATERPILLAR TRACTORS. 16 pages. La Plant-Choate Manufacturing Company, Cedar Rapids, Iowa.

FULLER COMPRESSORS AND VACCUM PUMPS. 16 pages. (Bulletin C-5). Fuller Company, Catasauqua, Pennsylvania.

BOOK REVIEWS

THE MANAGERIAL REVOLUTION, *by James Burnham. Published by the John Day Company, New York City. 285 pages. Price $2.50.*

Why would Hitler rather strike a deal with England than destroy the British Empire? Why is the present war different from the last? Why is "totalitarianism" not the issue? Why has Germany got to find a ruler better than Hitler, and Russia a ruler better than Stalin? Why is the New Deal something far bigger than Roosevelt can handle? Why can the world never divide again as it was in 1939? What is the future of America? Will Hitler destroy it? Can civilization be "destroyed"? Whose civilization? How destroyed?

Seeking replies to these profound inquiries, the author, attached to the Department of Philosophy, New York University, probes the past to project the future. "The past can teach us what is going to happen." And he

ARE YOU A QUALIFIED

Barber-Greene

OPERATOR?

Qualified Operators of Barber-Greene

Mixers

Finishers

Bucket Loaders

Ditchers

and

Snow Loaders

who successfully apply are registered by the B-G Service Department and receive a Certificate and watch fob medallion engraved with the operator's name and machine he operates. (300 hours required minimum.)

We file registrations so as to serve machine owners who want operators, or operators who are not employed.

This is rigidly restricted to qualified operators. Fobs or certificates are not available to others.

If you have had over 300 hours operating experience on any of the above Barber-Greenes, write for application form.

41-13

BARBER-GREENE

AURORA ILLINOIS

Trade Literature

STOP YOUR PUMPING TROUBLES WITH THESE DENVER PUMPS. 4 pages. (Bulletin P6-B). Denver Equipment Company, Denver.

MOORE STEAM TURBINES. 6 pages. (Bulletin 1951). Worthington Pump & Machinery Company, Harrison, New Jersey.

ROBINS VIBREX SCREENS. 4 pages. (Bulletin 118). Robins Conveying Belt Company, Passaic, New Jersey.

45-TON DIESEL ELECTRIC INDUSTRIAL SWITCHING LOCOMOTIVE. 16 pages. (Bulletin 8778). General Electric Company, Schenectady, New York.

AIR FOR DEFENSE. 4 pages. Schramm, Inc., West Chester, Pennsylvania.

SMITH-MOBILE—THE MODERN TRUCKMIXER AND AGITATOR. 16 pages. (Catalog 198-B). T. L. Smith Company, Milwaukee.

TYPE R-2 ROTARY SWITCHES. 16 pages. (Catalog 7140). Roller-Smith Company, Bethlehem, Pennsylvania.

SUPERIOR DIESEL ENGINES. 16 pages. (Bulletin 138). National Supply Company, Springfield, Ohio.

GATKE FABRIC BEARINGS. 12 pages. Gatke Corporation, Chicago.

PORTER LOCOMOTIVES FOR QUARRIES. 16 pages. (Bulletin 203). H. K. Porter Company, Pittsburgh.

MULTI-STAGE FINE REDUCTION CRUSHER. 24 pages. (Bulletin 1113). Traylor Engineering & Manufacturing Company, Allentown, Pennsylvania.

KIRKHAM VIBRATOR BLOCK MACHINE. 4

Write for Catalog No. 44

Speeding up production in Defense Industries

Handling cement, lime and stone for essential construction work . . . hauling vital supplies and raw materials . . . delivering all kinds of small finished products . . . and scores of earth moving jobs around airports, cantonments and munitions plants . . . are just a few of the operations now being performed with speed and economy by Brooks LOAD LUGGERS all over America.

These modern hoisting-dumping units are more important than ever, as they can be mounted on any standard chassis to increase truck efficiency, and conserve equipment. The Brooks LOAD LUGGER makes man-power count!

Ask About our Special Introductory Offer

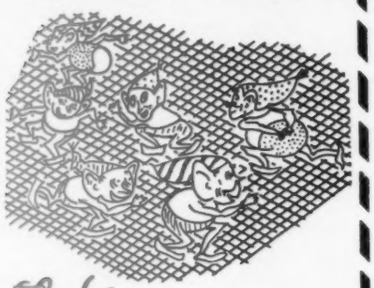
Distributors in all Principal Cities

KNOXVILLE TENNESSEE

103 Davenport Road

Brooks EQUIPMENT AND MFG. CO.

"ALL-OUT" VIBRATION



Leahy HEAVY DUTY VIBRATING SCREEN

ALL-OUT means just that! . . . triple-powered vibration to the limits of the screen, and uniformly distributed over the entire area. This is the result you get with the LEAHY Type "C" No-Blind Vibrating Screen when equipped with TRI-VIBE. You get more output per square foot . . . greater capacity with a smaller screen. It's worth investigating.

Write for Bulletin 14-H

The Deister Concentrator Company
The Original Deister Co.
Est. 1906
911 Glasgow Ave., Fort Wayne, Ind.

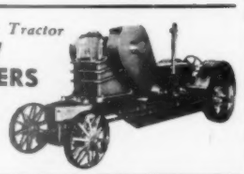
"Established in 1885"

LARGE PRODUCTION MINIMUM UPKEEP

FREE—Write for Catalog 601 and Specifications

Bronze or Roller Bearing
JAW CRUSHERS
Heavy Armor plate steel or cast steel Constructed
Large capacity
Small power Requirements

Self Traveling Tractor
JAW CRUSHERS
Ideal for maintenance road work



LIMESTONE PULVERIZERS
Stationary or Portable
Adjustable
Crushes Large Stone to 2" minus Down to Agricultural Dust
Built In (8 sizes)

Portable Model with Folding Bucket Elevator

GRUENDLER
CRUSHERS · PULVERIZERS · GRINDERS
GRUENDLER CRUSHER & PULVERIZER CO.
2905-15 N. Market St., St. Louis, Mo.

sees and makes us see with fearful vision an actual revolution: "It began yesterday and continues today, and the only element of prediction lies in expecting it to be completed tomorrow."

The capitalists, in the sense of the owners, are through, the author says. "Capitalism will disappear within a couple of decades, perhaps in a couple of years! We have been capitalist only for a tiny fraction of human history. Continuous mass unemployment—not a new thing in the world—has always been a symptom of coming change, and with mounting debts and other signs, shows that the capitalist order is in its death agony."

PRACTICAL ARC WELDING, *by W. J. Chaffee. Published by Hobart Trade School, Inc., Troy, Ohio. 516 pages. Price $2.00.*

Arc welding today is the country's seventh largest industry and one of the Allies' most important defense tools. Tanks, guns, planes, ships, and military vehicles are now completely arc welded. Add to this tremendous program the abnormal amount of arc welding performed in all places where metal is joined, and you begin to comprehend how prominent a place arc welding holds in American industry today. Part I in the book is devoted to general welding information. Part II and III are devoted to the complete series of arc-welding lessons exactly as they are offered in the Hobart Trade School. Parts IV and V contain a complete dictionary of welding terms and much helpful tabular data for operators and designers. The handbook also has an 8-page cross reference index for the reader's convenience.

COLLECTIVE BARGAINING CONTRACTS. *Published by the Bureau of National Affairs, Inc., Washington, D. C. 740 pages. Price $7.50.*

This volume, prepared by the staff of *Labor Relations Reporter,* is designed to meet a practical need—by advice from successful negotiators on boths sides of the conference table and by a wealth of contract clauses taken from current agreements, classified to show how employer-employee problems have been settled.

The section, "Techniques in Collective Bargaining," covers everything from strategy in winning maximum advantages to ways by which agreements may be made to work satisfactorily. "Good Bargains and Bad Bargains," by Professor Sumner H. Slichter of Harvard University, explains the economic setting of the problems before negotiators. First-aid and long-range methods used in healing labor controversies are set forth by Dr. John R. Steelmen, Director of the United States Conciliation Service.

The second section is the heart of the book. Called the "Contract Clause-Finder," it is designed to show what other employers and unions have done about the demands and counter-demands which make up the substance of collective bargaining. Because of the way in which these 2,000 or so clauses are classified, sub-classified, and explained, they give a birds-eye view of the hundreds of problems which arise in labor relations from day to day.

A third section of the book consists of working models of complete agreements.

Contents of the volume are made available by a full index.

A.S.T.M. STANDARDS ON MINERAL AGGREGATES. *Published by American Society for Testing Materials, Philadelphia. 150 pages. Price $1.25.*

This publication issued by the American Society for Testing Materials in December, 1941, is the first special compilation of specifications, definitions, and methods of sampling and testing mineral aggregates. Fifty standards are given in their latest form. While most of the specifications pertain to concrete and concrete aggregates and to road and paving materials, there are standards pertaining to the following fields: lime, gypsum, masonry mortar, glass products, waterproofing and roofing materials.

The 29 specifications given carry standard requirements for such materials as concrete aggregates, sand for use in plaster, lightweight aggregates, crushed stone, mineral filler, gravel, etc.

There are 21 standardized methods of sampling and testing, all of these being used to determine important properties of these materials.

A.S.T.M. STANDARDS ON CEMENT, *published by the American Society for Testing Materials, Philadelphia. 100 Pages—Price $1.00.*

Possibly the most important item in this 1941 compilation is the newly adopted standard giving specification requirements for Portland cement (C 150—41). This provides chemical and physical requirements for five types including high early strength, low heat of hydration and high sulphate resistance cements. This compilation is intended to provide a convenient source of reference to all of the A.S.T.M. tests and specifications for cement. Natural cement and masonry cement are covered in two specifications and the extensive methods of chemical analysis and sampling and physical testing of portland cement are given in their latest approved form with the Manual of Cement Testing and a group of selected references. Tests for compressive strength and fineness (turbidimeter) and the requirements for determining autoclave expansion are also given.

The Pomona Pump Company announces the purchase of the Westco Pump Division of Micro-Westco, Inc., Bettendorf, Iowa. The newly acquired business will be operated as the Pomona Pump Company, Westco Division, at 2621 Locust Street, St. Louis.

A BOOK EVERYONE SELLING ST. LOUIS SHOULD HAVE!

FREE... 24 pages of essential market data

Never before, in one pocket-size book, so much up-to-date, helpful market data on St. Louis. Gives you actual comparisons between St. Louis and other principal markets with which you are familiar.

Twenty-four pages, packed with vital information on retail, wholesale and manufacturing businesses. A must for anyone selling St. Louis.

Write on your business letterhead for your free copy today. Address: Hotel Mayfair, 838 St. Charles St., St. Louis, Mo. P.S. You'll really enjoy a stop at Hotel Mayfair. Nationally famous for friendly, efficient hospitality, good food and real comfort. And downtown St. Louis is right at your doorstep!

Over 50% of rooms, $3.50 or less, single; $5.00 or less, double.

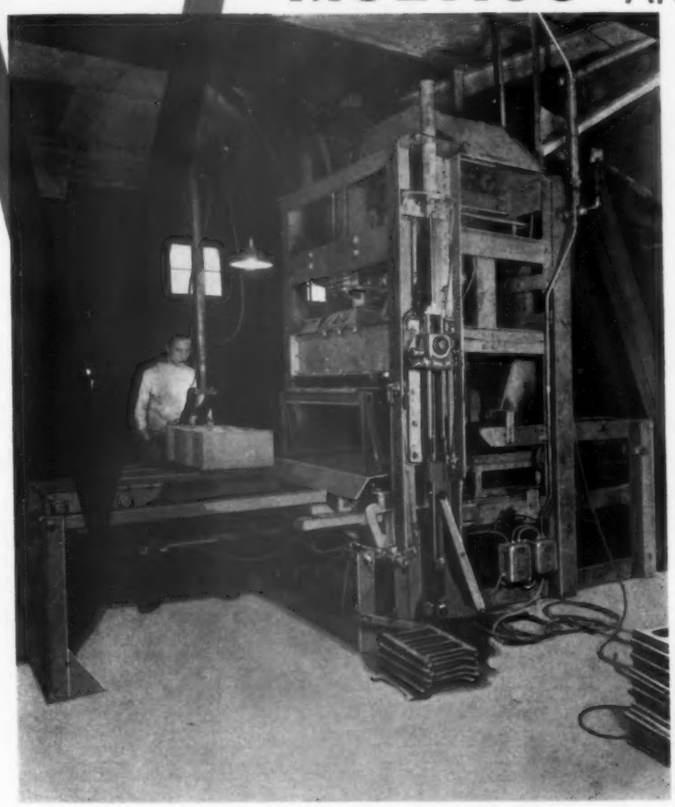
hotel Mayfair St. Louis

March, 1942

The CONCRETE MANUFACTURER

A Special Section of ...

—3 Model **MULTICO** IS 1A IN DESIGN AND A1 IN PERFORMANCE for **CONCRETE BLOCK Production**



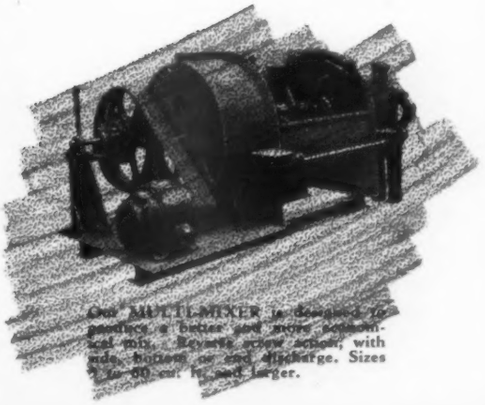
MULTICO *is doing a big job well for the Cecil Block Co., of Detroit, Mich.*

Operators of important concrete products plants are "drafting" the new MULTICO for "the duration" in the defense and industrial program.

The modern MULTICO combines pressure, vibration and tamping in the moulding cycle—the *positive* method of assuring top quality blocks, of uniform density and texture. Rate, 9 units per minute.

MULTICO can be operated 100% by compressed air . . . by a combination of air and electric power . . . or by electric power drive alone. When pneumatically driven, many working parts are eliminated, with a proportionate reduction in maintenance cost.

Write for Bulletin with detailed information about the complete MULTIPLEX Line, including Power Tampers, Hand Machines, Flue Block Machines, Hand Press Strippers, etc.



Our MULTI-MIXER is designed for speedier, better and more economical mix. Reverse screw action, with side, bottom or end discharge. Sizes 1 to 90 cu. ft. and larger.

The *Multiplex* CONCRETE MACHINERY CO.
Elmore Ohio

The CONCRETE MANUFACTURER

March, 1942

A SPECIAL SECTION OF PIT AND QUARRY DEVOTED TO PRODUCTION MARKETING AND USES OF CONCRETE PRODUCTS AND READY-MIXED CONCRETE

Published by Pit and Quarry Publications
538 South Clark St. Chicago

H. W. BAUMGARTNER
President

STANLEY A. PHILLIPS
Vice-President and Directing Editor

Field Editor:
W. E. TRAUFFER

Associate Editor:
HARRY F. UTLEY

Circulation Manager:
W. T. KLUSSMAN

Advertising Manager:
JAMES E. MONTGOMERY
Telephone HARrison 8558
Chicago, Ill.

Eastern Advertising Manager:
W. A. WILSON
Room 1235, 101 Park Ave.
Telephone CAledonia 5-4438
New York, N. Y.

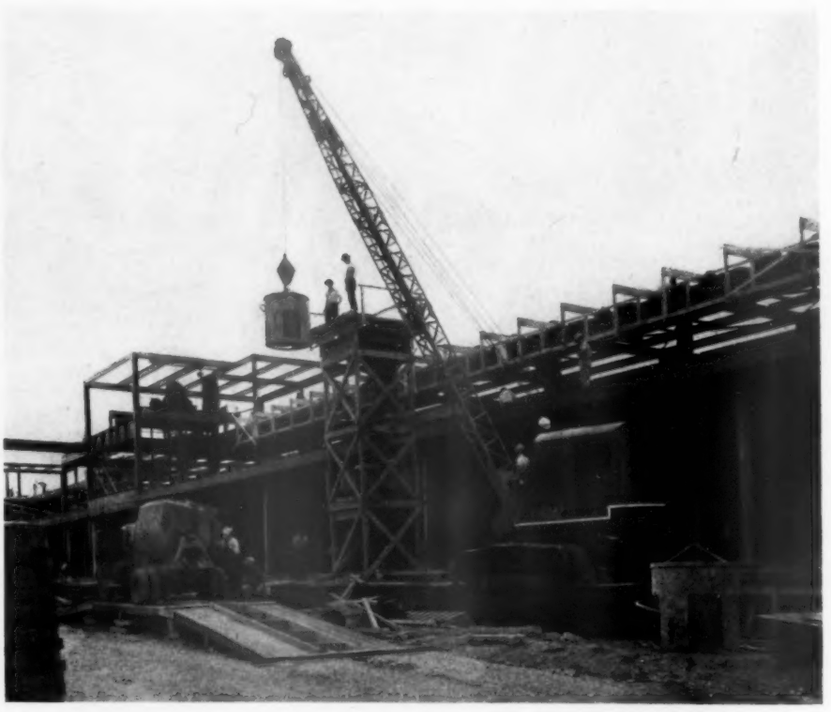
Central Advertising Manager:
D. R. EGBERT
Auditorium Bldg.
Telephone CHerry 4432
Cleveland, O.

Advertising Representatives:
A. C. PETERSEN
Chicago, Ill.

W. H. GRUBBS
Western Pacific Bldg.
Telephone Prospect 3746
Los Angeles, Cal.

ROBERT W. WALKER
68 Post Street
Telephone Sutter 6706
San Francisco, Cal.

Field Representatives:
J. K. GARESCHE
H. C. FINLEY



This unique set-up is being used by the Fruco Construction Company at the St. Louis Ordnance Plant. A heavy-duty ¾-cubic yard Bay City Diesel crane and a 45-foot tower are mounted on a flatcar as a combination for delivering concrete from a Concrete Transport truck mixer to an elevated bin. The bin is equipped with two chutes—one for the first floor and one for the second—making it possible to pour at two floor levels without moving equipment or changing chutes. The flatcar is moved from one setting to another by using a drag line cable on the front drum of the crane.

Toledo Block Plant Damaged by Blaze

Fire caused damage estimated at $7,000 to one building and equipment at the plant of the Columbia Concrete Products Company at Toledo recently.

The company had been shipping most of its output to Camp Perry where considerable construction work has been in progress.

Kansas City Meeting Draws Record Crowd

The regional meeting of the National Concrete Masonry Association, held February 2, 3 and 4 at the Hotel Muehlebach, Kansas City, drew an attendance of about 235 concrete-products manufacturers and other interested individuals. The program, except for the local speakers, was practically a repetition of that presented at Buffalo in January, according to E. W. Dienhart, assistant secretary, the general theme being wall construction and surface finish.

Speakers included Clarence M. Moore, chief coördinator of building materials, Parsons (Kansas) Ordnance Plant, who spoke of the *Importance of Concrete Products in Defense Projects;* Donald McCormick, Tulsa architect, whose topic was *Beauty in Concrete;* and Albert Owens, president of the Kansas City chapter of the American Institute of Architects, who reviewed the progress made in the utilization of concrete block in the Kansas City area in recent years.

Erects Flagpole at Batching Plant

Shortly after the entrance of the United States into the World War, employes and officials of the Ready Mixed Concrete Company, Indianapolis, purchased a new flag-pole and flag. A ceremony was then arranged at which all employes pledged allegiance to the flag and country. The pole extends 55 feet into the air and the flag measures 8 by 12 feet.

Operating Problems, Priority Rulings Discussed by Ready-Mixed Producers

READY - MIXED - CONCRETE operators attending the annual convention of the National Ready-Mixed Concrete Association at Cincinnati on January 28, 29, 30 heard a number of interesting papers and participated in some lively discussion during the sessions, most of which were held jointly with those of the National Sand and Gravel Association which met concurrently at the Netherland Plaza Hotel.

Durability of Concrete as Affected by Aggregates was the subject of a paper by Stanton Walker. He pointed out that in spite of modern methods and research there is too much concrete which has not given a good account of itself. The most common offender, he said, is the proportioning methods used. Much concrete is being made too wet or with too little cement and in many cases improperly-graded aggregates are used. Placement and design problems are also often handled carelessly or unskilfully, resulting in a much shorter life for the concrete than could reasonably be expected. Unsound cement, he said, is an increasingly rare offender. Impure mixing water also is rarely to blame and available information makes such cases inexcusable. Organic impurities in the aggregates are seldom the cause and result only from failures to apply available knowledge. The fact must be faced, said Mr. Walker, that unsound aggregates are often at fault.

He then described the four types of disintegration of concrete which can be traced to unsound aggregates: pitting, spalling, surface-scaling, and map-cracking.

Pitting is the most common and is usually caused by the disintegration of weak, friable pieces which are destroyed by frost and allied agencies with little change in volume.

Spalling is caused for the most part by coarse aggregate which is fairly hard and strong but the pieces of which change greatly in volume on exposure to freezing or thawing in the presence of moisture.

Surface scaling, when due to unsound aggregates, may be considered as an aggravated condition resulting from the pitting and spalling action, principally of the fine aggregate. In this condition unsound pieces of fine aggregate are so widely distributed and closely spaced as to result in complete surface disintegration over a considerable area.

Map-cracking, said Mr. Walker, may be evidence of incipient spalling due to coarse aggregate pieces or of volume changes of such pieces sufficient to break the bond with the mortar matrix but insufficient to dislodge the surrounding matrix. In some cases, he said, map-cracking has been found to result from chemical reactions between constituents of the cement and of the aggregate.

According to the speaker, there are two things to be done to correct this situation. One is that producers learn the status of the materials they are producing or using. This will be as far as most of them will need to go, but there will be many cases where some improvement in product is desirable. The next step he advises is a careful study of what can be done to improve the situation and the adoption of measures to better the conditions found responsible. This may mean some modification of plant methods and equipment, the selection of materials in a deposit or even limitation of the purposes for which an aggregate is to be used. Slides were then shown to illustrate the various types of disintegration with an explanation of the causes.

Mr. Walker briefly described the work done by his and other research organizations on this subject and pointed out that the success of this work depends largely on the amount of coöperation received from the producers and users of aggregates. Otherwise, he warned, groups with an interest in the problem as a whole but not in the aggregate producer might force the solution by eliminating from use doubtful or border-line materials. It is up to the individual producer to protect his own interests.

Wm. E. Whitelaw and Ralph Brill, North Cincinnati Sand & Gravel Company, watching a demonstration by James R. Herriott, Chain Belt Company.

In discussing freezing-and-thawing tests Mr. Walker said that many concrete specimens lost no weight and showed no visible defects but lost a very large proportion of their strength. The technique of testing concrete has made important advances in recent years, the most important of which, in his opinion, is the development of a method for measuring the modulus of elasticity by "dynamic" or "sonic" methods. This method takes advantage of a long-established law that an elastic material of given dimensions will vibrate at different frequencies depending on its modulus of elasticity. The modulus of elasticity of concrete is known to vary with its quality as affected by various factors, including exposure. In making these tests, said Mr. Walker, the frequency at which a specimen vibrates is measured and the modulus of elasticity is then calculated. Measurements are taken at various periods of exposure of both the degree and the rate of destruction. As the frequencies of these specimens are about three octaves above middle C, the average ear is a poor device for measuring them and a fairly complicated apparatus is necessary. Such measurements, he said, are made in less than 30 seconds. He then presented some evidence of the close relationship between the modulus of elasticity and strength as a measure of the effect of freezing and thawing and the similar relation between strength and volume changes.

Mr. Walker said that these tests have checked fairly well with the way concrete acts in service, but that there is much room for improvement. More must be known about the service records of the materials in question and he again emphasized the importance of environment.

The subject of *Cold Weather Concreting* was thoroughly covered by Harold F. Clemmer, Engineer of Materials, District of Columbia Department of Highways. He spoke of the greatly increased speed with which concrete construction work is now being done, especially on the rush defense jobs now under way. Where 7 to 14 days were formerly required for curing, this is now in many cases taking only 24 hours without any sacrifice of quality. The necessity for continuous pours is another reason why this is being done. In many cases also the nor-

mal construction period has been considerably extended into the winter. The improvement in the uniformity and quality of cements in general in recent years has helped to make all this possible.

Mr. Clemmer said that the water content must be watched very carefully when high-early-strength cement is used and a temperature in the vicinity of 70 degrees F. is recommended. In the District of Columbia the mixing water must be heated when the outdoor temperature is below 50 degrees F. and both the water and the aggregates must be heated at temperatures under 35 degrees F. He said that the cement temperature is also important as water must sometimes be heated to a temperature as high as 180 degrees F. as cold cement coming into contact with this water might flash set.

The speaker said that the effectiveness of calcium chloride in giving quick strength to concrete increases as temperatures get lower, a fact especially important when pouring thin slabs of concrete, as the quick cooling is counteracted by the early heat of hydration. In a chart he showed how high early strength can be obtained by adding calcium chloride or an extra sack of standard cement when high-early-strength cement is not available.

In Washington, said Mr. Clemmer, all pavements are opened to traffic within 3 days and all intersections within 24 hours after pouring. In one case where a 7.4-bag mix and calcium chloride were used a 467-pound flexural strength, equivalent to 2,500-pound compressive strength, was obtained in 19 hours at which time the pavement was opened to heavy truck traffic. Experience has shown that a 20-per cent. increase in strength is obtained from the addition of an extra sack of cement and 1 pound of calcium chloride per sack. This, or some other accepted accelerator, must be used whenever the temperature is below 50 degrees F. At these temperatures pouring must cease at 3:00 p.m. so that the cement can get its initial set and heat before the temperature drops. The advisability of this practice, said Mr. Clemmer, is shown by the fact that cold-weather cylinders made at 10:00 a. m. will be stronger than those made at 3:00 o'clock because of the rising temperature in the morning.

Mr. Clemmer said that the addition of up to 4 per cent. of calcium chloride does heat the concrete and speed up its setting time at below-freezing temperatures. At temperatures between 32 and 40 degrees F. a maximum of 3 per cent. is advisable and even at a temperature of 70 degrees F. from ½ to 1½ per cent. of calcium chloride is helpful. That calcium chloride also helps long-time strength, he said, has been proved by many tests, among which were some 11-year-old cylinders. Mr. Clemmer prefers calcium chloride in its flake form because it can then be added by volume instead of by weight. In the case of ready-mixed concrete which, he said, has added advantages in cold weather, the flake can be added at the job when any delay in delivery is anticipated.

In the discussion following this paper it was brought out that when calcium chloride or some other accelerator is used in concrete, the finishers must be on hand and follow the pouring as closely as possible. Mr. Clemmer advised the addition of the calcium chloride a minute before the concrete is to be discharged from the mixer as it dissolves very rapidly. He also said that most of the scaling of concrete attributed to the external application of calcium chloride to concrete was due to other causes and that no such scaling has ever occurred in Washington.

Mr. Clemmer admitted that his preference for calcium chloride over other admixtures was based partly on its lower cost and that others might be equally effective. He warned against permitting a concentrated solution to come in contact with cement.

One producer reported that calcium chloride was used in a housing job and that the concrete froze because it was poured late in an afternoon and was not protected sufficiently from the freezing weather.

Another reported pouring a pavement slab at a temperature of 8 degrees below zero with the concrete at about 50 degrees with no ill effects.

A producer in the Buffalo area said that engineers do not like concrete at temperatures much over 70 degrees F. because of the rapid temperature change which occurs after the concrete is poured in cold weather. He also reported delays in pouring concrete with calcium chloride up to an hour with no ill effect but advised against making a practice of this.

Another producer reported success obtained by batching the flake calcium chloride with the aggregates and then adding the cement and the water in the mixer. Such concrete was said to be good even after a delay of 1½ hours.

An open forum on ready-mixed-concrete operating problems gave the producers a welcome opportunity to exchange ideas on this subject under the guidance of Stephen Stepanian. One west coast producer described the prevailing practice there of using water meters to measure the water at the time of batching and the introduction of the water and other ingredients into the mixer simultaneously. An equipment manufacturer present briefly described the various types of measuring tanks available for use in plants and on truck-mixers or agitators. The one important thing to make sure, he said, is that the inlet and outlet pipes are large enough. The advantages of a water-measuring device which has a scale beam with provisions for moisture compensation were also mentioned.

H. F. Thomson (General Materials Company, St. Louis) was called on for comments on losses in slump with time under varying conditions. In his experience the loss of slump was greatest in warm weather and in many cases was due to unnecessarily long rotation of the mixer drum. This loss of slump, he said, did not necessarily mean loss of workability of the concrete. Most specifications affect the concrete as it is received at the job and the loss of slump *en route* must be allowed for by the producer. An equipment manufacturer cited a case in which the loss of slump was due to the use of a highly-absorptive aggregate.

Professor Ray B. Crepps of Purdue University cited a case where it was important to keep down the shrinkage in the concrete going into a wall. This was done by letting the concrete set for 3 hours and then remixing it before using. The remixed concrete was quite workable and set up within an hour after placing. The finished concrete showed no cracks.

There was considerable discussion of methods of handling aggregates to insure uniformity. The concensus of opinion was that the best results are obtained by storing multiple sizes and recombining them in batching. The use of long chutes extending into the stock-piles or bins was advocated as this eliminates both the breakage and segregation which occur when dropping aggregates from ordinary chutes to piles.

It seemed to be agreed that there is little variation in the concrete produced in various sizes, makes and types of truck-mixers under similar conditions. Most of the lack of uniformity encountered was thought to be the fault of the drivers. The condition of each mixer also has some effect on uniformity and much trouble is also due to overloading. It was also suggested that in many plants lack of control of the moisture content may be responsible. One producer said that he had had trouble in producing a uniform concrete due to a deficiency of fines in the aggregate. When this was corrected no further trouble was experienced.

The use of locking and timing devices was also discussed and aroused considerable interest because at least one state highway department has specified that a locking and timing device must be used and others are expected to fol-

low suit. The use of such equipment is said to be advocated because it eliminates the necessity for the usual inspector at the job. It was suggested that such control might be discouraged at least for the duration of the emergency.

Methods for handling different brands of cement and different lots of tested cement were also discussed. This problem seems to be worst in Washington, where each cement company has its own bins and batchers from which all the different concrete producers get their cement. A representative of a cement company said that three types of cement can meet almost any demands and that much of the present complication could be eliminated by dropping all other types. It was also suggested that another simplification would be the acceptance by the Government of state and county-tested cements and *vice versa*.

One producer said that his company is forced to carry five separate bulk cements and several kinds in sacks mainly because of preferences regarding color. Mr. Thomson said that his company sells in both Missouri and Illinois and that as many as 25 different makes and types of cement have been used within a 2-week period. This situation forced his company to use sacked cement for most of its output.

A complete report of other phases of the convention is contained on pages 50 to 62 of this issue of PIT AND QUARRY and readers are referred to this report for numerous topics of joint interest to ready-mixed-concrete and sand-and-gravel producers.

Ready-Mixed-Concrete Preference Ratings

By DEAN C. GALLAGHER

Chief, Maintenance and Repair Section, War Production Board

National Ready-Mixed-Concrete Association Convention, January 29

"The maintenance and repair of your present equipment, while it is important now, from now on is going to be much more important. At the present time we have a maintenance and repair order covering your industry, known as P-100. . . . Now, P-100 is not a good order. We all admit that. We all realize it down in Washington. But it is the best we have. But from now on, maintenance and repair orders will be designed so that we will know what equipment is being purchased for maintenance and repairs, who is buying it, and where the material is going in its end-use.

"But under P-100, unfortunately, we are not able to determine that. It is a very loose order. We have tried to define certain things, and when lawyers write definitions they are always very confusing. We have brought out P-100 to do away with the disorganization and misinterpretations that were going on in P-22. That wasn't entirely the fault of the people who were misinterpreting the order. It was mainly the fault of the then Office of Production Management. When the order came out, it seemed to be the desire of all the commodity sections in the Office of Production Management to interpret this order, rather than to refer it over to our group, which had written the order and probably knew what the correct answers were. As a consequence, there was a great deal of confusion and a great deal of material was purchased under that order which should never have been purchased.

"When the SPAB board was first brought into existence its over-all policy on maintenance and repair was to keep plants running at their then rate of production. That still is the policy. And that is a good policy because of the scarcity of raw materials and the various limitations orders on raw materials and on equipment which will naturally bring down the production of a plant, and it is highly important from the standpoint of employment and capital investment that we do keep a plant running consistent with its picture in the whole war program. So that is why P-100 was designed the way it is. . . .

"At the present time we are planning to release monthly the most important questions that are coming to our attention as to the proper application of maintenance and repair orders, and we think that by doing that we will overcome the great confusion that has existed.

"Most of the people in your industry have a very simple problem with regard to P-100. The more technical end of P-100 is the extension of orders after they have been sent to them by producers, which in your case is the ready-mixed-concrete industry. All you have to do is to determine whether or not the material you want to buy is under this order, and then send through the order. But as a producer the whole liability for violating the order lies with you, and not with the extensions by the distributor or the furnishing of material by him to you. So you have a very important decision to make when you send through an order on P-100, as to whether or not it is a material that is properly purchased under that order.

"In this new order, P-100, we have tried to define what type of material can be purchased by saying that no material can be bought if it is capitalized, and that means if it is subject to depreciation, because we know that governments, highway departments who use this order were buying snow plows, bulldozers, and all types of equipment under P-22, which under P-100 is not allowable, not only for the government but for anybody else.

"When we have an open order like this with no control we have to restrict the amount of material that is purchased under it, so we have arrived at a definition of a fixed asset and an operating supply, which shows you just exactly what material can be bought, and that definition is this: 'Operating supplies are materials required in the operation of a business, which are consumed and charged to operating expense during the current accounting period, and which under recognized accounting practices have an expected service life of less than one year.' So that absolutely denies the rating to buy anything that is capitalized, or practically denies you the right to the rating to buy any new equipment.

"In our first orders we forgot the welders; we forgot the machine-shops. We are now placing definite emphasis on welders and machine-shops to get not only the material they need to run their own shops but material they need to repair your equipment, and we are going to amend this order in a very few days and write in the order that a welder or machine-shop can get the raw material to go out and repair your equipment or farmers' equipment, which is very vital.

"There have been a great many cases where distributors and manufacturers who want to sell you material have come in with rubber stamps, and when you tell them, 'Well, I can't buy this without preference rating,' they tell you they have the stamp all made up with P-100 and want you to stamp it. That merely is an invitation to you to violate this order, because the distributor isn't worried about what item you buy because he is not liable under P-100, but you are liable.

"For instance, there is an inventory restriction in this order, and when your inventory for any quarter in 1942 gets above 110 per cent. of what it was in a similar quarter in 1940, then under the order you are not allowed to use its rating. But the distributor or another supplier doesn't care, as long as he gets you to stamp this order.

"So I suggest that you do not accept the advice of the distributor or manufacturer who wishes to sell you material and invites you to use P-100, because you might be in effect violating the order, and consequently you are liable and not the person who invites you to violate it. . .

"We have adopted a temporary procedure to allow manufacturers who make material for maintenance or repair—for instance, manufacturers who

make plumbing supplies, manufacturers who make electrical supplies, and heating repair men—when they come in to submit their requirements under the Production Requirements Plan to get a little more material so that they can bring this material up through the distributor and make it available for maintenance and repair without the need of a preference rating. We hope that will take care of the homes and the hotels and apartments. Then we hope, finally, to get around to the point where we can have a maintenance-and-repair order for industrial plants so designed that we can let you buy more material under some kind of control of material. For instance, if we got into a specific order for maintenance and repair, whereby you would report and accept the order, it might be conceivable that we could put in replacements of equipment under that type of order, but certainly we can not put them under this loose type of P-100 order."

The following questions, culled from correspondence between association members and Executive Secretary Ahearn, were asked by him and answered by Mr. Gallagher:

Q.—"P-56, which is the mine-repair order, is being administered on the basis that sand-and-gravel operations will not received mine serial numbers unless ten or more men are employed. Is there any restrictive policy with respect to P-100 if the operation is actually engaged in sand-and-gravel production?"

A.—"No. Any firm that is not qualified under P-56 qualifies under P-100."

Q.—"Since 'operating supplies' are defined in P-100 as excluding fuel and material which is physically incorporated in the product, what materials are regarded as being covered by the term 'operating supplies'?"

A.—"I would say your machine parts, your valves and fittings, cleaning agents, brushes, brooms, janitor supplies, paint."

Q.—"P-100 provides that it may not be used in placing orders for the replacement of an item carried on the producer's books as a fixed asset. Does this mean that the A-10 rating is unavailable for purchasing trucks and truck-mixer equipment used in the ready-mixed-concrete industry, if the trucks and equipment are actually intended to be used to replace existing equipment which is unfit or unsafe for use within the meaning of Sections (4) and (6) of P-100?"

A.—"The answer to that is the naturally such equipment would become capitalized, so therefore it couldn't be purchased, no matter whether it was a replacement or a new piece of equipment."

Q.—"P-100 provides that the terms 'maintenance,' 'repairs,' and 'operating supplies' do not include 'the replacement of an item carried on the producer's books as a fixed asset.' If a piece of equipment used in the ready-mixed-concrete industry should not be carried on our books as maintenance, repairs, or operating supplies, but should nevertheless wear out or be destroyed, or be rendered unfit or unsafe for service, may not P-100 be used for replacement under these circumstances, since it could not be regarded as an addition to or an expansion of property or equipment?"

F. N. Andersen, Andersen Sand & Gravel Company, Saginaw, Michigan, and R. F. Moss, Scientific Concrete Service Corporation, Washington.

A.—"I think the same answer holds good there. The basis for that is not whether or not the equipment is a replacement of an existing piece of equipment or whether or not the equipment is purchased for expansion. The control there is, is it capitalized in your business? If so, it can not be bought under this. Naturally that type of equipment would be capitalized."

Q.—"Does P-100 extend to the delivery of the products of a producer to the consumer or distributor? P-56 stops at the point where the materials are finally processed and ready to be shifted over to the medium of transportation."

A.—"Our order does and it doesn't. Our order allows the distributor to release from his stock order group and deliver the material and extend. That could go down to any supplier, up until the point where he fabricates that order. When he fabricates that order, our order also says that he can extend, but it is an impossibility for him to do it.

"If you have a quantity of raw materials and you are making an item that is going out on this preference rating, or to that preference rating, and to the other preference rating, it is impossible for you to say how much of that raw material comes under a certain preference rating. Consequently it is an impossibility.

"What we want the manufacturer to do is to formulate his rating pattern from the ratings that come in to him, from P-100, from PD-1, from Army and Navy orders, and then go in and qualify under the Production Requirements Plan to get the raw material, to furnish that raw material in the end-product in accordance with that rating pattern, so that spells it all out, how much material you need, rather than extending by preference rating in the raw material. . .

Q.—"P-56 provides for the use of A-1-a and A-1-c ratings for the procurement of repair and maintenance parts, if certain prescribed OPM tests are met. If a member of the ready-mixed-concrete industry is unable to effect delivery of replacement and maintenance parts and operating supplies because the A-10 rating is inadequate to move the goods, what further steps are open to him for obtaining a higher rating?"

A.—"At the present time we are considering the preparation of a new order which will take that into consideration, but also at present the only way that material can be purchased for maintenance and repair under P-100 at a rating higher than A-10 is by the filing of a PD-1. That sounds like a poor answer, but if you will file those PD-1's with the Maintenance and Repair Section and put on the PD-1 that you have tried to purchase this material under P-100 and find that you need a higher rating, we can process that PD-1 for you very quickly.

"On the other hand, if you are in an emeregency and your plant has broken down or is ready to break down, if you will telegraph the Maintenance and Repair Section and tell them the nature of your breakdown, what material you need, what rating your supplier wants to furnish you this material, and whether or not it is available in the hands of the supplier, we can process that for you in two or three hours. In other words, we get you the rating two or three hours after we receive your wire and get your plant running for you. Then you follow that up with a PD-1 to make it legal. That is the situation as it exists at the present time."

Q.—"Then the procedure is this: For a long-range cure you are drafting new provisions which will under stated circumstances permit the use of a higher rating than an A-10 rating, but in the interim there are two ways for this industry to proceed. First, they can file a PD-1 application, filing it with you. Or, in the event of an emergency situation, a breakdown or an emergency breakdown to-morrow or the day after, they can send you a telegram, stating the nature of the potential or actual breaking and stating the piece of equipment which they need and the rating which is necessary to move the equipment, and the name of the supplier, and also state whether or not the ma-

terial is available. Mr. Gallagher's address is Temporary Building E, 6th and Adams Drive, S. W., Washington, D. C.

"It is assumed that a member of the ready-mixed-concrete industry may file PD-1 applications for equipment intended to be used for the expansion or improvement of plant and operating facilities. If this is correct, to what Section of OPM should applications be originally submitted?

A.—"On improvement facilities, frankly, the best way to file PD-1's is to let them go in the way they are directed, because the first thing that happens to a PD-1 when it comes into the shop is that it is serialized. Then they have a man who routes that PD-1 to the principal commodity section of the material that is involved in that request. So if you send it to the man who is going to work on rating the PD-1, he has to send it back and get it serialized, and you lose a day at any rate. In sending those PD-1's for maintenance and repair to us, we are the ones who rate them, so we take them down the hall and get them serialized and rate them right in our own office. But on new equipment or improvements, the best way is to file them in the way it is directed."

Q.—"When you were speaking on the subject of inventories a minute ago, you said 110 per cent. of 1942 inventories compared with 1940. That was 1941, wasn't it?"

A.—"No. The order said 1940. It is better to use 1940. You get a better break in using 1940. Your materials were not so hard to get in 1940. They tightened up in 1941. So your inventories went down in 1941. Your quarter inventories for 1942 are never allowed to go beyond 110 per cent. of the inventory for the same period of 1940."

Q.—"It has been stated that allowances for inventory use will be made for producers operating on an overtime basis, since it was realized that extra shifts use abnormal amounts of operating supplies and increase the necessity for maintenance and repairs due to machine fatigue. Are producers included in this group required to submit any special applications to the WPB for approval for war production?"

A.—"Regardless of anything else, when your total inventory of maintenance, repair and operating supplies reaches 110 per cent.—that is, of course, provided that you purchase over $5,000 worth in a quarter—then, in order to use the order further, you should make application in advance to our office, and tell us in your first letter that your inventory is in excess of the restrictions outlined in the order and get our permission for you to use the order until you get your inventory report in to us.

"Probably some people thought that if they spotted their inventory with us we would shut them down and tell them they had too much material. That is not the case. If you have too much material, we would like to have you use it and not buy more material, but if you have run short on certain material which is necessary to run your plant, we certainly are set up to allow you that privilege. If anybody has got an excess inventory, it is more or less water over the dam. What we would like to have him do, when he has reached that point, is not to buy anything except what he absolutely needs until he expends that inventory out into his equipment.

"We will act very promptly on any requests, and we would like to have them if your inventory is high. Some people get the impression that if they use P-100 only a few times to buy a few little things they should not have to bother about their inventory, that it is based on the amount of material they buy. That is not true. As soon as you use P-100 your whole inventory is under that control.

"We have almost unlimited facilities now to have all the industrial firms in the country comply with all the preference-rating orders. We are utilizing the field force of the Wage and Hour Administration and the Federal Trade Administration, as the activities of those agencies are diminishing. We are also using the FBI in cases. We have more field men than we know what to do with, so naturally they are going to work. Almost any day they might walk into your plant and say, 'Let's see your inventory,' if you are using P-100. So it is highly important for you to be absolutely on the legal side on this order."

Q.—"On this $5,000 provision for quarterly purchases, does that include all operating supplies, such as gasoline operating trucks, or only maintenance repair trucks?

A.—"It includes all the operating supplies, except fuel and non-ferrous packaging material."

L. D. Mortensen, L. R. Snow, and E. C. Knowlton, Utah Sand & Gravel Products Corporation, Salt Lake City, and D. A. Kalton, Chain Belt Company.

Q.—"It does not include fuel for running trucks?"

A.—"No. No kind of fuel, fuel for your plant or gasoline, or any non-ferrous packaging material.

Q.—"Very frequently a truck will have a relatively minor item that puts the equipment out of commission until it can be replaced. Under this telegraph procedure outlined, does your office want to be bothered with the little items of $40 or $50 for trucks?"

A.—"The motor part of your trucks should be taken care of. They have designed P-54 and P-57, and now P-95, which assure the manufacturer of automobile parts and farm equipment parts enough material so that they don't have to have preference ratings to release the material. It is very hard to draw the line between what material a manufacturer buys that goes into truck parts and that that goes into private-car parts. We have tried to keep the individual from having to furnish preference ratings, and as a result we have taken all automotive parts and tried to bring them up through the distributor, so that you don't need preference ratings.

"On automotive parts the Chief of the Automotive Branch has told me that any time we find distributors or manufacturers asking for preference ratings on automotive parts we are not to grant them but are to tell the man who has asked for that preference rating to get in touch with the Automotive Branch, and they will see that a preference rating doesn't have to be given.

"On your mixer parts, if the purchase of a minor part, we will say, needs an A-1 rating and causes your mixer to be out of commission, and that mixer has been working on a job and is needed on that job, I would say that is an emergency, and that no matter how little the part is it should be handled as an emergency by telegram."

Q.—"You spoke particularly about the engine portion of the truck. How about the rear axle or ring gears?"

A.—"I think that all the chassis and motor parts are covered in that order.

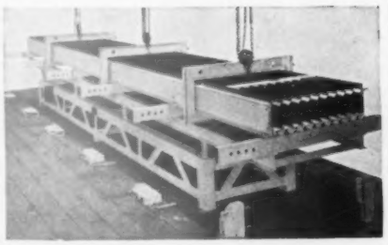
Q.—"In one instance an operator has been buying steel, special alloy steel, for axles directly from the steel company, and has the axle turned."

A.—"We could handle that item."

Q.—"That would be subject to the telegraphic procedure?"

A.—"Yes. That isn't just ordinary run of parts."

Q.—"One of the states of the Union is going to require the ready-mixed-concrete manufacturer to install on his mixer trucks a locking device and a recording device, or the mixer truck may not be used on state highways. Would you consider those two items as maintenance items or repair parts?"



KIRK & BLUM

STEEL FORMS
for Concrete Joists

These forms are made in standard 20-ft. lengths. Also special lengths to meet individual requirements. The illustration above shows method of removing complete set of poured joists, which permits multiple production where desirable or feasible.

HEAVY DUTY VIBRATING TABLES can be furnished

We manufacture Sewer Forms—Curb and Gutter Forms—Steel Concrete Forms of all Kinds. Write for details—no obligation.

THE KIRK & BLUM MFG. CO.
2818 Spring Grove Avenue
Cincinnati • Ohio

STONEX
Concrete Floors
—•—
The De Luxe Tile of Distinctive Style
—•—
ALL COLORS
ALL SHAPES
ALL SIZES
HARD as granite
EASY to place
LOW in COST

YOU CAN NOW BECOME AN AUTHORIZED STONEX LICENSEE FOR: $650
(Equipment, Sales Helps Included)

Start with STONEX as a sideline, and it will soon be the main stem of your business.

Write for details

STONEX INDUSTRIES
33 N. La Salle St. . . Chicago

A.—"How much do they cost?"

Q.—"The locking device and the recording device probably will run up to $300 and will involve a very complicated mechanism. It means that if these articles are not supplied, perhaps 300 or more mixer-trucks will not be eligible to participate in the construction of state highways."

A.—"They are not purchasable under this order. I would file PD-1 on those, or PD-1-a when it comes out. They will probably last two or three years on that truck, once they are put on. You will probably depreciate them if they cost $300."

Q.—"It might be possible for the Government to do some teamwork and say to the state highway department that it might be logical to forget this this requirement during the duration of the war."

A.—"I think that that can be done. We have a conservation and substitution branch that is very vitally concerned in things like that. For instance, a great many factories are making their men wear badges to identify themselves, and a great many factories wanted to have these badges made of copper or bronze. They began flowing on this P-100, and we found out about it and went to the Substitution Section. We cut that out, and they are now wearing a sort of plastic material."

Q.—"Suppose we would have ring-gear pinions in stock and would use those to make emergency repairs. Now we should keep one of those in stock. Can we work that without an order, or do we have to have one on that?"

A.—"I believe if you can't get it without an A-10 rating, it is perfectly right to get it with the A-10 rating."

Q.—"A-10 won't get it."

A.—"Then it is a PD-1."

Q.—"This could be handled through your office? That is a repair part for maintenance."

A.—"Yes."

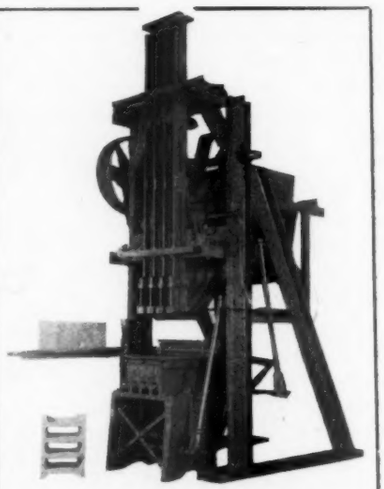
Q.—"The rule has been that the manufacturers of automobile parts had to retain a certain percentage of those in their factory, and in doing that the distributors were not able in some instances to get parts, so that the ready-mixed-concrete operators could get them, such as axles or almost anything else."

A.—"Yes, that was true. I understand it has been rectified, and the distributors can get the parts."

★ ★ ★ ★ ★

Insure the future of America. . . .
Buy Defense Stamps and Bonds

★ ★ ★ ★ ★



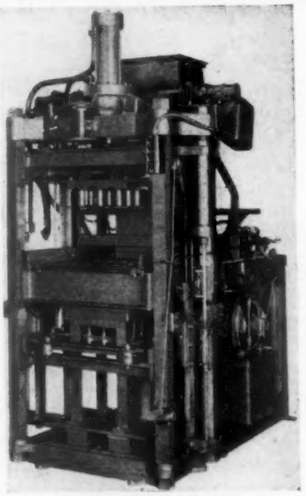
An All-Purpose Machine

The Junior Stripper will turn out more blocks per man than any other hand-operated machine on the market . . . 200 per hour being easily maintained! Nor has quality of output been sacrificed for the sake of speed. Units are uniformly dense, true to shape, of uniform texture.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers and Joltcrete, Stearns mixers, and Cast Iron and Press Steel pallets Straublox oscillating attachments, etc. Repair parts for: Anchor, Ideal Universal, Stearns, Blystone mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
G. M. Friel, Manager Columbus, Ohio

Why not BUY
the LATEST
FASTEST
and BEST
PRODUCTION BLOCK MACHINE



HYDRAULIC
VIBRA PRESS

Write for information.

KENT MACHINE CO.
Cuyahoga Falls, Ohio

Unitized Batching Speeds Production of Concrete for Big Ordnance Plant

In this view, from left to right, are the sand, cement, and gravel-batching plants. Note elevation of cranes enabling operators to see into cars.

NEARING completion in St. Louis, Missouri is one of the largest and most important of the many armanent projects under way in this country. The St. Louis Small Arms Plant, which will be operated by the Western Cartridge Company, will probably be the largest plant of its kind in the world when completed and in full operation about March 1942. Some units of this plant have already been in operation for several months. The total cost of this project will be nearly $100,000,000 and the completed plant will employ about 20,000 workers. It is strictly a bullet manufacturing and loading plant and the finished products will be stored elsewhere.

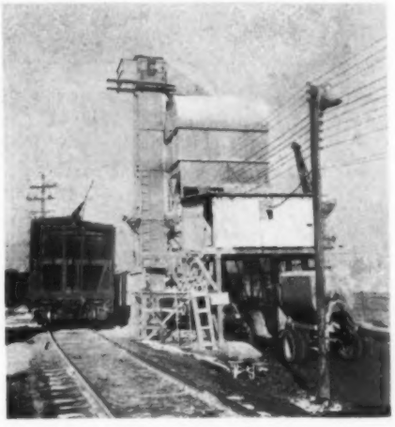
The contract for the construction of this project is shared by the Massman Construction Company, the Fruin-Colnan Construction Company and the Fruco Construction Company. The Fred Schmitt Material Company, a leading ready-mixed-concrete producer and material dealer of St. Louis, has the sub-contract for the production of the concrete for this project; all the concrete will be ready-mixed. Jack Israel, who is in charge of concrete production, has had wide experience in construction work as a member of the firm of Israel Brothers and in the production and use of ready-mixed concrete.

Ground was broken for this project in February 1941. All the batching equipment used was received at the yard on cars at noon on Thursday, May 8 and concrete deliveries were started on the morning of Monday, May 12. By September 21 the 125,000 cubic yards in the original contract had been delivered but meanwhile the project had been expanded so as to require between 325,000 and 350,000 cubic yards of concrete. More than 300,000 cubic yards had been delivered by January 1, 1942. In the months of September and October the deliveries totaled 96,000 cubic yards in spite of much rain.

The arrangement of the batching equipment for loading the truck-mixers differs from the conventional but was chosen to fit the existing conditions and the equipment and has worked out very satisfactorily. The equipment and all the stock-piles are between two railroad spur tracks 90 feet apart in a space 450 feet long. In this narrow space are the separate sand-, cement- and gravel-batching plants and stock-piles containing 30 carloads of sand and 60 carloads of gravel. The empty open-top truck-mixers go first to the sand-batching plant where they are loaded with sand and water for a 2-cubic yard batch. They are then driven 80 feet to the cement batcher and finally 25 feet to the gravel batcher. They must be backed under the gravel batcher, but, as a complete turn would have to be made anyhow, due to the unavoidable lack of space for a U-turn, this is no great disadvantage. The truck-mixer blade is kept turning all this time and is speeded up after the cement is added. This sequence of operations makes is possible to mix 2 cubic yards in a mixer of 1½-cubic yard capacity and produce a concrete meeting all specification requirements.

By W. E. TRAUFFER

During periods of "peak" demand the trucks flow through in a steady stream at intervals of 35 seconds, and an empty truck is loaded and on its way less than 3 minutes after its arrival. This system, according to Mr. Israel, is faster than a single large batching plant would be operating under similar conditions and a dual batching plant would be necessary for equal capacity. The writer was told that a line-up of trucks at any batcher was a very rare occurrence and during his visit no truck was delayed more than a few seconds. The plant office is at the entrance to the yard and as the trucks come in on one side the drivers deposit their tickets in a box. As they leave with a load they pick up their tickets from a swinging arm on the other side of the office. This makes it unnecessary for the drivers to get out of their cabs at the yard. At the job it seldom takes more than 1½ minutes to unload a mixer, and trucks are seldom kept waiting.



The cement-batching plant with bulk-cement car and elevator at left.

Bulk cement is received in special cars and is unloaded from a track on a trestle on the west side of the yard. A screw-conveyor and a bucket-elevator feed the cement to the 350-barrel C. S. Johnson cement bin. The weighing is done in a Johnson batcher which, like all the other cement-handling equipment, is fully inclosed and dustless.

The sand-batching plant consists of a 110-cubic yard, 2-compartment Johnson steel bin and a weighing batcher of the same make. A Link-Belt Speeder

LS 85 gasoline crane, with a 35-foot boom and a 1¼-cubic yard Kiesler clam-shell bucket, unloads the sand from the cars to the stock-piles or to the bin. Mississippi River sand is used and a very small amount of very fine sand is added from the second compartment.

The Johnson 2-compartment gravel-batching bin has a capacity of 135 cubic yards and is supplied from stock-piles or cars by a Link-Belt Diesel crane with a 2½-cubic yard Owen clam-shell bucket on a 50-foot boom. Meramec River gravel in ¾- and 1½-inch sizes

The gravel-batching plant with crane unloading car at left.

is used. During periods of "peak" demand as many as 80 cars of sand and gravel have been unloaded and used in a day of three 8-hour shifts. Some of the credit for this speed is due to the fact that the cranes are kept operating at a high enough elevation for the operators to be able to see into the cars they are unloading. Up to 2,600 cubic yards of concrete has been produced in

An open-top truck-mixer being loaded with sand and water.

Jack Israel, in charge of production, and T. H. Fleming, of the Concrete Transport Mixer Company.

24 hours and the "peak" hourly production is 130 to 140 cubic yards. This has been accomplished with only a few minor changes in the batching equipment to speed up and simplify operations. For example, it was found that the installation of a simple 3-way deflector under the gravel batcher spreads the gravel more evenly through the open-top truck-mixers and speeds up mixing considerably.

The original mixer fleet consisted of 15 new Concrete Transport open-top mixers but, when the contract was extended and greater capacity and longer hauls were necessary, 15 more Concrete Transport mixers were added. All these mixers are mounted on Ford 95-horsepower truck chassis with Eaton 2-speed rear axles. In each mixer the blades are driven from the truck motor through a 2-speed power take-off. The mixing is usually done at a blade speed of 12 r.p.m. for 2 or 3 minutes with the truck in low gear. Then the mixer-blade speed is shifted into low, or 3 to 4 r.p.m., while the truck proceeds in high gear the remaining distance to the job site. Some of these mixers early in November had already delivered over 12,000 cubic yards of concrete each since the project was started. This would be a normal 4-year job for similar truck-mixers making ordinary commercial deliveries. It was never found necessary to divert from their usual business any of the 26 Concrete Transport mixers which make deliveries from the company's permanent commercial plant several miles from this project.

All the buildings of the small-arms plant are of reinforced-concrete construction with brick curtain walls and considerable concrete is also used for platforms, walks, etc. The specified compressive strength is 3,500 p.s.i. at 28 days and this has been consistently exceeded at 7 days. A 5½-sack mix of standard Portland cement is used and the total water content is held as close as possible to 5½ gallons per sack. Aggregate moisture tests are made 3 or 4 times daily and allowances are made accordingly. Tests of the concrete are made regularly by the Pittsburgh Testing Laboratory and three inspectors check all the concrete mixing and placing operations.

Several types of admixtures were tried in the concrete and calcium chloride is now used to get the best possible results in cold weather. Provisions were installed for heating after the contract was extended and it became certain that winter operation would be necessary. Two 80-horsepower oil-fired boilers supply steam at 100-pound pressure to pipes under the stockpiles and jets in the two aggregate bins. Another 80-horsepower boiler heats the mixing water through a pipe coil.

Ed Olsen Named Head of Wisconsin Group

Ed Olsen, Oshkosh, president of the Badger Concrete Company, was elected president of the revived Wisconsin Concrete Products Association at a meeting held February 2 in Milwaukee.

Other officers of the association, which was first organized 20 years ago for the purpose of improving the quality of concrete products and extending their use, are Herbert Loucks, Madison, first vice-president; W. H. Goezinger, Milwaukee, second vice-president; L. E. Schwalbe, Wauwatosa, treasurer; Arthur Devos, Milwaukee, secretary, and Al Kruschke, Eau Claire; Michael Engersbach, Milwaukee; Arthur Sorenson, Racine; Otto Ladwig, Milwaukee, and Arthur Grube, Sheboygan, directors.

EQUIPMENT WANTED

1500— 4x16 45% air space Pressed Steel pallets.
1000—10x16 45% air space Pressed Steel pallets.
1000—12x16 45% air space Pressed Steel pallets.
1500— 8x16 40% air space Pressed Steel pallets.
Jack lift truck, hand or power operated. Stearns or Anchor Bottom block machine to be placed under tamper.

Reply to:
ALLIED STONE PRODUCTS CO.
5th & Howertown Road Northampton, Pa.

WANTED

2,000 or more new or used Steel Pallets for a 1939 model Besser Victory Tamper, size 12½"x18" or 18½" or 19" long, ¼" or 7/16" thick.

BLOOMINGTON CONCRETE PRODUCTS
Normal, Illinois

FOR SALE

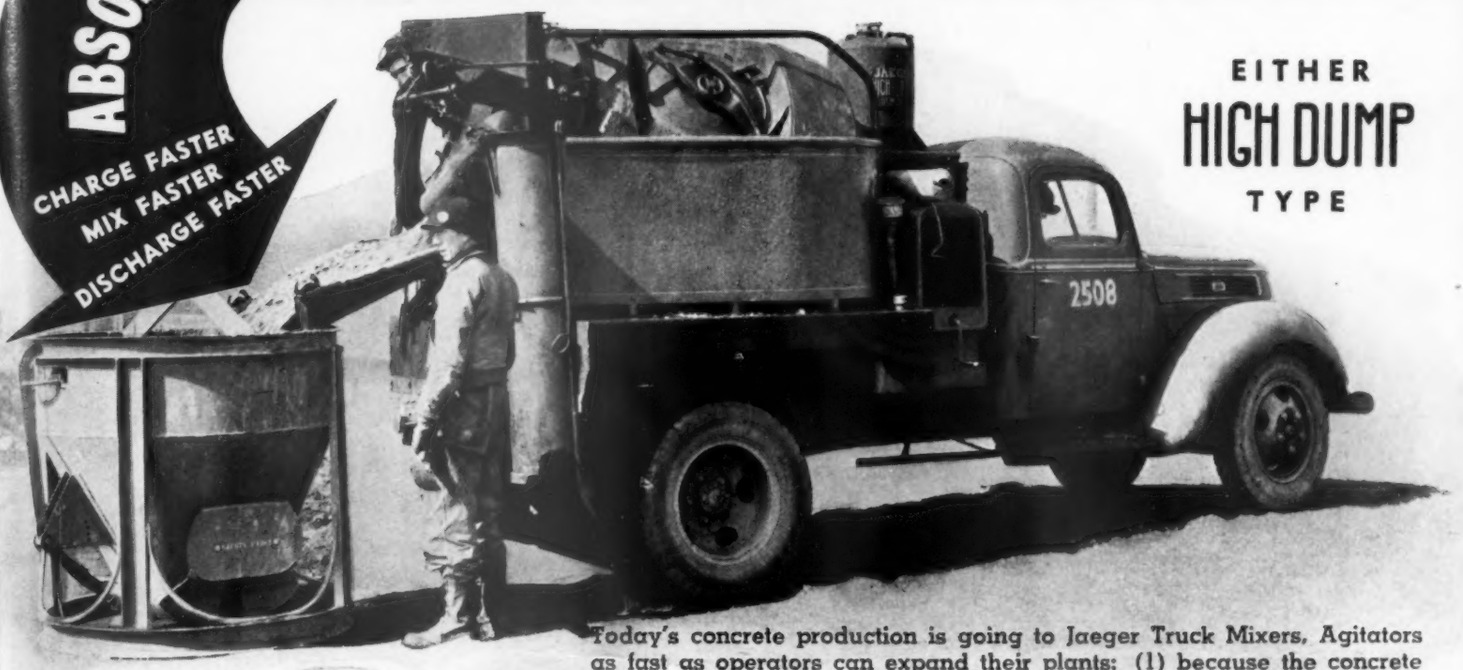
Leahy No Blind Vibrating Screen, 3 Decker.
One Anchor Tamper.
One Down Face Universal Block Machine, 8" and 10" Attachment.

CHICAGO INSULCRETE CO.
10376 Franklin Ave. Franklin Park, Ill.

ABSOLUTELY, YOU CAN MAKE MORE MONEY with JAEGERS

CHARGE FASTER
MIX FASTER
DISCHARGE FASTER

EITHER
HIGH DUMP
TYPE



Today's concrete production is going to Jaeger Truck Mixers, Agitators as fast as operators can expand their plants: (1) because the concrete industry has proof of the *higher quality* of material produced by the Jaeger Dual-Mix Drum; (2) because opportunities for comparison, on this year's gigantic projects, have proved beyond question that Jaegers, whether HIGH DUMP or Standard LOW CHARGE, can load, mix and discharge faster than any other mixers of their type.

Jaeger, alone, offers this higher payload production with standard 2-Speed Transmission (Separate Engine or Vacuum-Controlled Truck Engine Drive), One-Shot Top Loading, Vacuum-Controlled High Discharge Door, End-to-End Water Sprays and Mixing in Sealed Drums — *in the only line that completely meets every specification and operating demand.*

Combination Top or End Loading with Jaeger Hopper Attachment:

Specially adapted to older or temporary plants not equipped for fast ribbon loading. Permits top or end charging to meet conditions. Only end loader that does not constrict drum opening or require moving Hopper to discharge. Single turn of hand wheel opens Discharge Gate. No second seal to leak or wear.

OR
LOW CHARGE

A DRUM-FULL
— OR A CUPFUL
— AT A TIME

JAEGER PORTABLE HOPPER

Saves Truck Mixers Waiting—Means 25% More Payloads per Day on the Average Job.

Tows to job behind truck mixer —takes full 2 or 3 yd. batches. One hopper serves almost

THIS HANDY BLANK BRINGS YOU FULL INFORMATION
Complete Data, Models, Specifications, Prices, Terms

THE JAEGER MACHINE COMPANY
602 Dublin Avenue, Columbus, Ohio

Send us newest information on ☐ Standard LOW CHARGE Truck Mixers, Agitators, ☐ HIGH DUMP Models, ☐ Portable Hoppers, ☐ Auto-Pavers and Spreaders, ☐ Pumps, ☐ Mixers, ☐ Hoists, ☐ Carts

Name_____

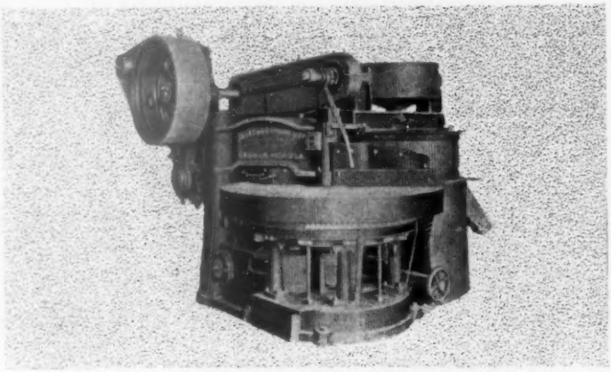
Address_____

The CONCRETE MANUFACTURER

"It's really a BRICK!"

THE "J & C" PRESS

makes *better* Concrete Brick



Users say that they can make high quality concrete brick *faster* and *cheaper* on a "J & C" automatic machine.

All brick are accurately sized—have clean, uniform edges—are smooth textured, and high in strength.

Brick can be produced either vapor cured or high pressure cured. High pressure steam curing eliminates expense of yard stocking and aging. NO PALLETS USED.

Capacity of "J & C" Model "A" Machine, 3200 brick per hour. Capacity of Model "C" Machine, 1600 brick per hour.

Write for Information.

THE JACKSON & CHURCH CO.

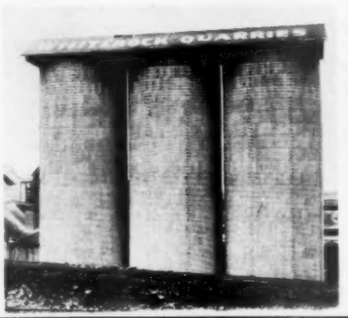
Saginaw, Michigan

THIS BIN IS BUILT TO LAST

Special construction features make Neff & Fry bins *high on strength and low on maintenance.*

- Concrete staves molded by 150 tons pressure.
- Staves have diagonal ends for greater locking strength.
- Steel hoops for proper reinforcement.

Quick erection . . . thousands in service. For details, write



THE NEFF & FRY CO.
CAMDEN, OHIO

HOTEL PHILADELPHIAN

FORMERLY HOTEL PENNSYLVANIA

DANIEL CRAWFORD, Jr., Manager
39th and CHESTNUT STREETS
PHILADELPHIA, PENNA.

Our courteous and competent staff will give you the utmost in friendliness, comfort and service. Conveniently located to all stations, and only five minutes away from the heart of the business section.

600 ROOMS each with bath from $3.00 up
RADIOS IN EVERY ROOM

Lounge and Restaurants. Unrestricted Parking to 3 a.m.

Pit and Quarry Helps You Operate More Profitably

Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

To keep its readers fully informed, PIT AND QUARRY taps every source. Our field editors travel more than 30,000 miles a year to describe the processes and methods used by the outstanding plants making your type of product. Government activities affecting the field are interpreted so that you can better adjust your business to their regulations. Complete reports of all important conventions are published in PIT AND QUARRY. The new equipment and supplies which may make production more efficient are announced in each issue.

Reading PIT AND QUARRY is like having a conference every month with the leading men in your industry. You don't have to stir out of your chair to get information that otherwise would take you years to obtain by your own efforts and experience.

The cost of this service is only $1 a year. Start your subscription at once by just filling and mailing the coupon below.

Return This Coupon To-day—Start Your Subscription with the March issue

PIT AND QUARRY PUBLICATIONS,
538 So. Clark Street, Chicago, Illinois.

Enclosed find remittance for which enter my subscription to Pit and Quarry for.....

1 year ($1.00).....starting with the March issue. (Foreign add $1.00 per year.)

My Name.....Title.....

Company Name.....

Send to (Address).....

We Produce.....

JOHNSON
ROADBUILDERS' ELEVATING CEMENT CHARGER

100% HIGHWAY PORTABLE UNIT

ONE MAN OPERATION

MEETS ALL STATES' SPECIFICATIONS

FAST AND FLEXIBLE

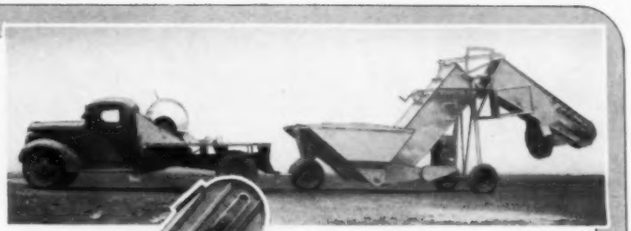
★ Meets all highway specifications. Wheels, equipped with Timken Roller Bearings withstand any towing speed.

★ All controls are within easy reach of operator's platform.

★ Average batching time is fifty seconds for a two batch truck.

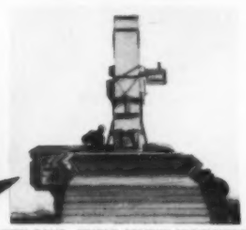
★ Can easily be converted into an efficient transfer plant or a charger for truck mixers. Can be towed and set up anywhere a truck will go.

★ 25-barrel receiving hopper gives adequate storage for car change and minor delay.



ELEVATING CHARGER IN TOWING POSITION

CHARGING A TRUCK MIXER



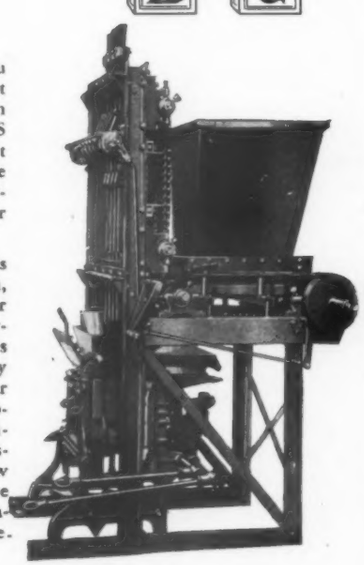
WITH RAMP—WHERE CEMENT IS DELIVERED BY BULK CEMENT TRUCKS

JOHNSON CEMENT HANDLING EQUIPMENT INCLUDES THE DUTCH MILL, STORAGE BINS AND SILOS

For Further Details Write **C. S. JOHNSON CO.** *Champaign, Illinois*

Miles CONCRETE EQUIPMENT

simple as A B C



It isn't how MUCH you invest that counts, but WHAT YOU EARN on your investment. MILES Concrete Products Plant Equipment will insure increased output, at lower first cost and lower operating cost.

MILES equipment is simple in construction, yet ruggedly built for the severest kind of service. Expert mechanics are unnecessary . . . any workman can keep your MILES equipment operating in first-class condition at all times. Investigate! Get the facts now . . write for a complete catalog of MILES machinery for the concrete-products plant.

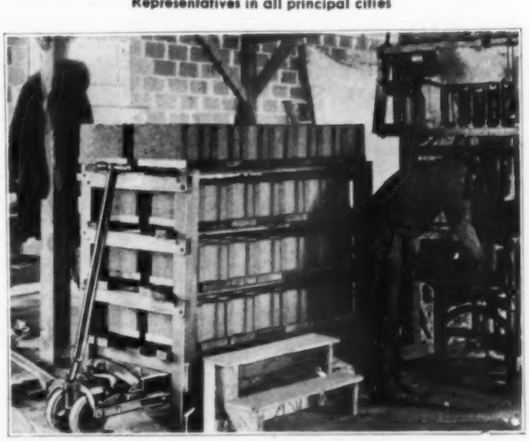
MILES MANUFACTURING CO.
JACKSON, MICHIGAN

BARRETT LIFT-TRUCKS
ONE MAN HANDLES 48 BLOCKS NO BREAKAGE

Handle your green concrete products the way that more than 800 other concrete products plants do, WITH BARRETT LIFT-TRUCKS EQUIPPED WITH A SUPER-SPRING FRAME AND RUBBER TIRES. Eliminate breakage—jogging out of shape and spoilage. Save time, money and labor by eliminating all unnecessary handling and breakage. Take your blocks direct from the machine to the curing room—with ease and dispatch. One man handles 48 blocks of the 8x8x16 size—or, 32 blocks of the 8x12x16 size.

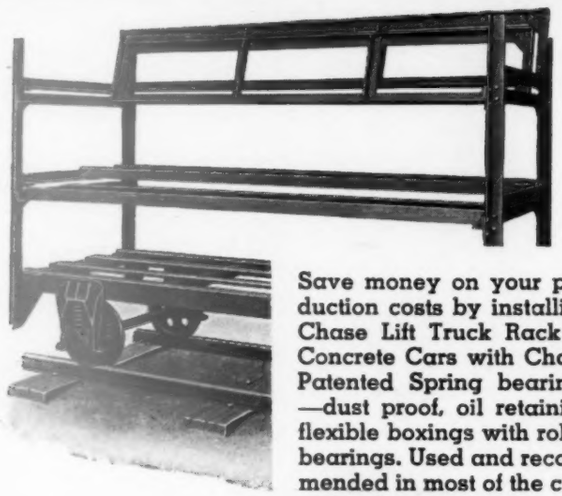
Write for illustrated circular.

BARRETT-CRAVENS COMPANY
3251 West 30th Street CHICAGO, IL
Representatives in all principal cities



The CONCRETE MANUFACTURER

LOW INITIAL COST
LOW MAINTENANCE COST



Save money on your production costs by installing Chase Lift Truck Rack or Concrete Cars with Chase Patented Spring bearings —dust proof, oil retaining flexible boxings with roller bearings. Used and recommended in most of the concrete plants.

WRITE
For Catalog and
Special Low Prices

Complete line of concrete block cars, decks, Lift Truck Racks, transfer cars, turntables, dump cars, etc.

CHASE DRYER CARS & TRANSFER CARS

CHASE FOUNDRY & MFG. CO. COLUMBUS, OHIO

The "Quinn Standard"
FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 30 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

Quinn Heavy Duty Pipe Forms

Hand or wet process. Built to give more years of service—sizes for any diameter pipe from 12 to 84 inches—tongue and groove or bell end pipe—any length.

Quinn Medium Duty Pipe Forms

For making pipe 12 to 60 inches in diameter—any length.

WRITE TODAY

Complete information, prices and estimates sent on request.

QUINN WIRE & IRON WORKS 1627 12th ST. BOONE, IA.

JEFFREY

FIRST SOURCE—FIRST CHOICE

FOR A

COMPLETE LINE OF PRODUCTS

Chains	Idlers	Pulverizers
Conveyors	Screens	Portables
Elevators	Crushers	Dryers
Feeders	Grinders	Coolers
Car Pullers		Mono-veyor systems
Transmission machinery		Investigate

THE JEFFREY MANUFACTURING CO.

917-99 North Fourth Street, Columbus, Ohio

Baltimore	Cincinnati	Houston	Philadelphia
Birmingham	Cleveland	Huntington	Scranton
Boston	Denver	Milwaukee	St. Louis
Buffalo	Detroit	New York	Salt Lake City
Chicago	Harlan	Pittsburgh	Terre Haute

SPOT WELD YOUR MESH!
FOR GREATER STRENGTH

Welding cages with ALLAN Portable Welding Machine

with ALLAN Portable Spot Welder for welding concrete pipe reinforcement. This FAST, EASY, SURE, ECONOMICAL method *Reduces the* Cost of the product. Write for details

ALLAN MFG. & WELDING CO., Inc.
BUFFALO, NEW YORK

Check IN AT A DeWITT OPERATED HOTEL

In Cleveland
THE HOLLENDEN
In Columbus
THE NEIL HOUSE
In Akron
THE MAYFLOWER
In Lancaster, O.
THE LANCASTER
In Corning, N. Y.
THE BARON STEUBEN

THEO. DeWITT PRESIDENT

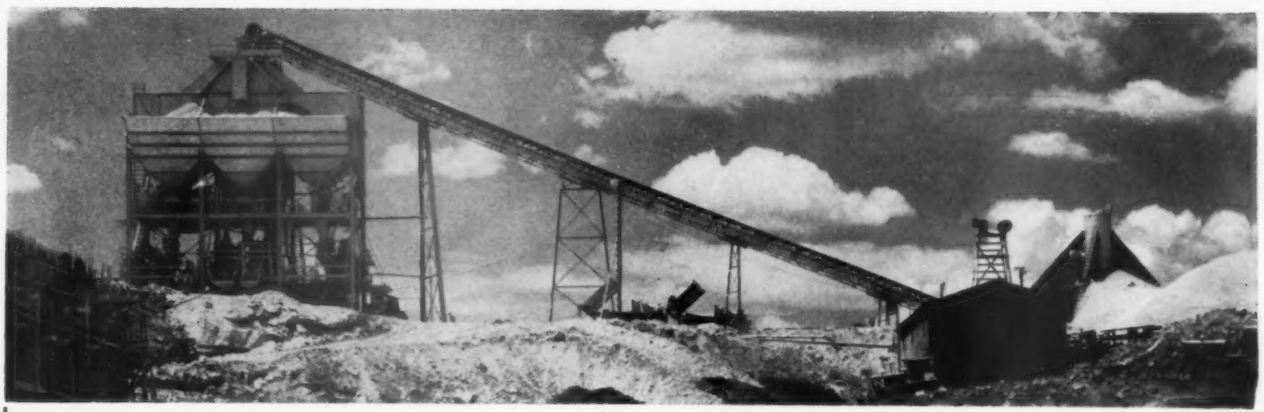
DeWITT OPERATED HOTELS

RESULTS . . . not promises!

LEADERSHIP isn't something that can be promised for, or argued into, a concern . . . or a magazine. Leadership must be earned and won. PIT AND QUARRY has attained that leadership in its field by giving readers and advertisers alike what they demand in an industrial publication. As a result, PIT AND QUARRY leads in *total circulation* and *producer circulation* . . . in *advertising volume* and *reader preference*.

FOLLOW A LEADER . . . subscribe for . . . advertise in

PIT AND QUARRY



So You Want to Pour Concrete *EIGHT DAYS A WEEK!*

In this hour of National Emergency, many engineers and construction men would like to do just that; but until they change the calendar, we doubt if it can be done. They're doing the next best thing, though—they are producing it in Butler plants.

More than 250 cubic yards of concrete per hour out of one transit plant, more than four hundred yards per hour out of a central-mixing plant *twenty-four hours a day*, attest to the production of which these plants are capable. And remember that all-out production calls for smooth, trouble-free operation and the maximum in efficiency.

Now that speed is essential, let Butler Bins keep 'em pouring!

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN

SAUERMAN
Long Range
MACHINES

This picture shows how Sauerman Cableway digs dry and wet gravel and moves material to top of screening plant at total cost of a few cents per cubic yard.

•

(Upper View) A simple Sauerman Power Drag Scraper installation stores and reclaims seasonal surplus of crushed fines at large stone crushing plant.

PROBLEMS of moving gravel, sand, crushed rock, distances of 100 to 1000 ft. or more are solved cheaply with SAUERMAN Scraper or Cableway machines.

There is a double saving when you use a SAUERMAN machine. You keep down your equipment outlay and your daily operating expense is lower than with any other equipment able to dig and haul an equal yardage. One man handles the entire operation. Capacities range from 10 to 1000 tons per hour.

SAUERMAN engineers will be glad to study your excavating and stockpiling problems. Their advice may help you to increase your profits. Investigation costs you nothing.

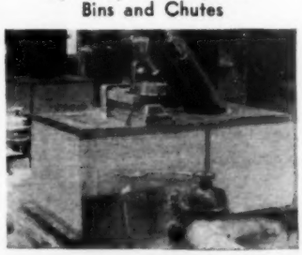
Write for Catalog.

SAUERMAN BROS., Inc.
534 S. Clinton St. Chicago, Ill., U. S. A.

Put *"VIBRATION"* To Work
MOVING MATERIALS THE EASY WAY

ELECTRO-MAGNET VIBRATORS
Open Up "Constipated" Bins and Chutes

VIBRATORY FEEDERS
From lbs. to tons per hour by the twist of a Rheostat.



GRAVIMETRIC FEEDERS
Weigh Feed Material to a 99% Accuracy.

VIBRATING PACKERS
Increase the Net Contents of barrels, drums, etc.

Write for New 1942 Catalogue

SYNTRON CO.
385 Carson Street **Homer City, Pa.**

The CONCRETE MANUFACTURER

There must be a good reason when a block manufacturer buys three Stearns Joltcrete Machines, one after another!

Gray Concrete Pipe Co., one of the leading concrete products manufacturers in the South, operates three Joltcretes. Left: Two in their Hagerstown plant. Supt. Aaron H. Davidson and Asst. Supt. Gail A. Mullendore watching operations.

At Thomasville, N. C., Gray operates a third Joltcrete. Below: W. Clyde Brandon, Block Plant Superintendent.

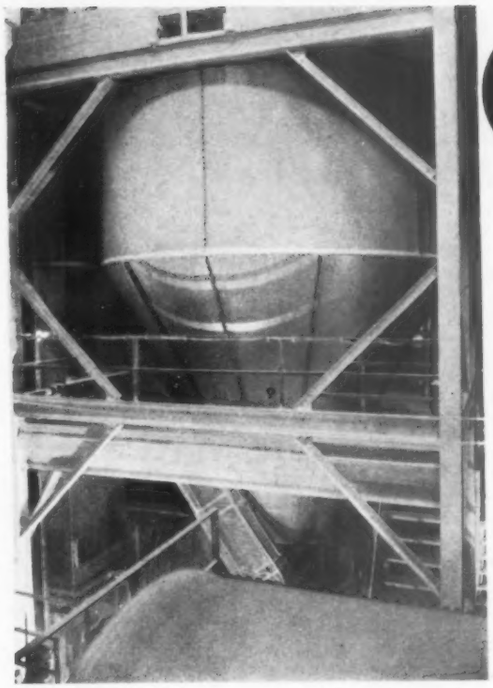
STEARNS Joltcrete Block Machines not only make superior wall units that sell fast, but their first cost is low —sometimes scarcely half the cost of other equipment required to produce the same output.

Write for Stearns Joltcrete Folder and figures of initial and operating costs.

STEARNS
MANUFACTURING CO. - ADRIAN, MICH.
GENE OLSEN, PRESIDENT

Manufacturers of Complete Equipment for Concrete Products Plants.

We bought Stearns Joltcrete Machines because they make a superior block at low cost.
GRAY CONCRETE PIPE CO.
P. B. Gray



This GAYCO is helping twelve other GAYCOS to produce up to 45 tons per 24-hour day in a modern talc plant.

GAYCO

Centrifugal
AIR SEPARATOR

Manufacturers also of "Reliance" Crushers, Screens, Elevators, Conveyors, Bin Gates, Grizzlies, and complete Crushing, Screening and Washing Plants for sand, gravel and crushed stone.

Fills every need in *Fine Sizing*

In this emergency, GAYCO'S engineering experience in the development and application of air separating equipment will be of vital value to producers of powdered materials.

Whatever your problem, GAYCO offers its facilities and service in helping you to work out an economical solution.

The GAYCO Centrifugal Air Separator with its patented fan action provides instant and positive adjustment for the entire range of classification from 60-mesh to 400-mesh fineness.

Universal Road Machinery Company
Rupert M. Gay Division, 117 Liberty St., New York, N. Y.

Canadian Representative:
F. H. Hopkins & Co. Ltd.,
Montreal

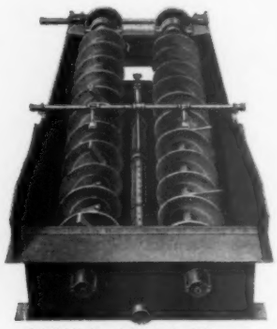
AMERICA HAS A JOB TO DO...

CAPACITIES
SHOVELS—¾ YARD TO 3½ YARDS
DRAGLINES—VARIABLE
CRANES—13 TONS TO 60 TONS

America has a job to do. Unless your quarry is equipped with modern, efficient equipment, you are not in a position to give full support to the Nation's needs in this great emergency. Why not look into the merits of LIMA shovels, draglines, and cranes today. You will find them to be up to the minute in design with features that help to make big output possible. Bulletins are available on any type or size. Write today for your copy.

LIMA LOCOMOTIVE WORKS, INCORPORATED
Shovel and Crane Division **LIMA, OHIO**

EAGLE "Swintek" Screen Nozzle Ladder is an "ace in the hole" for every dredge operator. Works deep deposits and eliminates slug pumping. Reduces time, power and labor costs. Capacities increased up to 400%.



EAGLE Double Spiral Screw Washer

Write for our new Washer Bulletin, showing latest developments.

Eagle EQUIPMENT

LEADS IN DEFENSE
for Product Quality, Efficiency and Economy

SAND AND GRAVEL PRODUCERS know that State and Federal specifications are "tightening up" due to defense construction requirements. Yet users of EAGLE Washers will be able to meet all demands for fine aggregate, however stringent, because of the low cost operation of EAGLE equipment.

EAGLE Washers are taking the lead in creating new operating economies. They are now available in several types and many sizes.

We are constantly designing new machines for special applications. Our engineers are at your disposal to help you attain "all-out" production.

EAGLE Double Roll Crusher
EAGLE Shale Planer

EAGLE Grinder
Olson Self-Dumping Cages

EAGLE Dry and Wet Pans
Specialized Mining Equipment

EAGLE IRON WORKS
DES MOINES - IOWA

BE PREPARED *with* BAUGHMAN SPREADERS

The Mammoth

The Master

The New Marvel

1942 Demands More Agricultural Limestone

With Baughman Limestone Spreaders on the job you can easily fill the big orders to come for agricultural limestone—and be assured of properly applying the limestone on farmers' fields because the specially-designed revolving disc maintains an even distribution up to 40 feet in width.

There is a Baughman Spreader to fit your plant and market—models range from 6 to 18 tons in size, including the three models shown here.

Get the facts today on the outstanding features of the 9 to 1 favorite spreader in 1941.

BAUGHMAN MFG. CO.
Specializing in Spreading Equipment
JERSEYVILLE, ILLINOIS

SIMPLICITY GYRATING SCREENS

Use the correct basic principle of Positive Eccentric Action, produced by a solid shaft with the counter-balanced machined directly thereon, an exclusive patented Simplicity feature.

Other Simplicity features are the special rubber corner supports, screen cloth in tension four ways over a doubly crowned screen deck, and sturdy all steel construction with each machine finished in every detail.

Simplicity Gyrating Screens are available in sizes from a 2′ x 3′ up to a 5′ x 12′ in single shaft assemblies; built in one, two, three, and four decks; as standard inclined types and also as low head types, where desired.

"New Bulletin No. 41 now available"

SIMPLICITY ENGINEERING CO.
DURAND, MICHIGAN

Save steel

AND SAVE MONEY WITH NAYLOR *Light-weight* PIPE

Why waste vital war material and money using heavy wall pipe where Naylor light-weight pipe can do the job?

Due to Naylor's exclusive Lockseam Spiralweld structure, this light-weight pipe provides the extra strength and safety which enables you to use it on applications usually requiring heavier-wall pipe. Thus you save steel and money without sacrificing pipe performance. Remember, Naylor is the only light-weight pipe engineered to give you all these savings. That's why it will pay you to specify Naylor on your requirements.

Naylor Light-Weight Pipe is ideal for air lines, de-watering pipe, hydraulic mining, ventilating pipe, high and low pressure water lines, diesel intake and exhaust lines, dredging pipe, sand and gravel conveying lines.

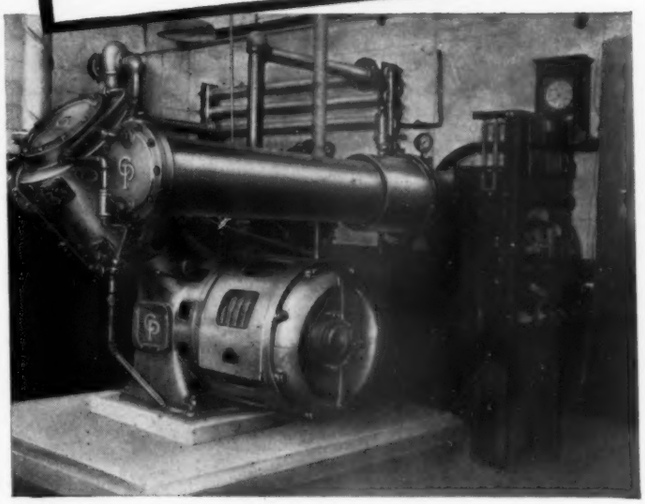
Sizes from 4" to 30" in diameter with all types of fittings and connections. Complete fabrication service.

Write for Naylor Catalog or send specifications for quotations.

NAYLOR PIPE COMPANY
1257 EAST NINETY-SECOND STREET
CHICAGO, ILLINOIS

NAYLOR LOCKSEAM SPIRALWELD **PIPE**

Type "Y" Compressor quickly installed...shipped intact... requires simple foundation and small space



Shipped intact, quickly installed with only a simple, inexpensive foundation, CP Type "Y" Compressor solves the problem of the new plant that must have air quickly. Extremely compact and requiring small floor space, it is ideal for the crowded plant that must have additional air.

Chicago Pneumatic Type "Y" Compressors are of the heavy duty, double-acting type. Two-stage units are available in capacities of 300 to 900 cubic feet per minute, 80 to 125 lbs. of pressure, with built-in or coupled induction or synchronous motor, or with V-belt drive. Units for other pressures are also built. Bulletin on request.

CHICAGO PNEUMATIC TOOL COMPANY

General Offices: 6 E. 44th St., New York, N. Y.

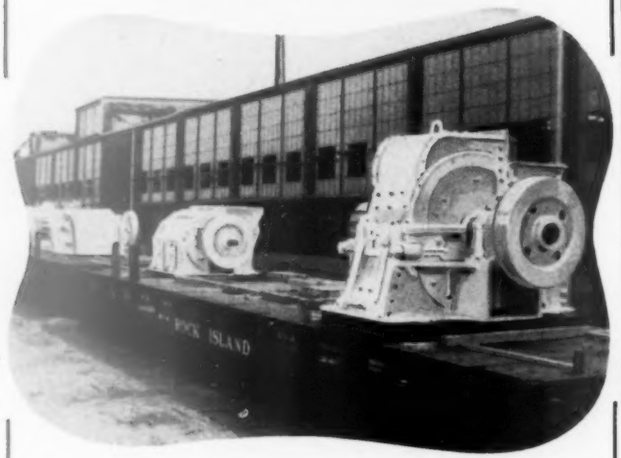
CHICAGO PNEUMATIC

AIR COMPRESSORS

ALSO: Pneumatic Tools, Electric Tools, Rock Drills, Hydraulic Aviation Accessories, Diesel Engines

★ ★ ★

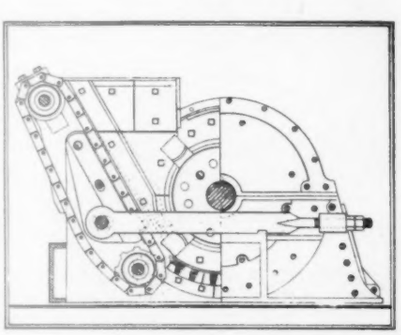
Aluminum Company Relies on DIXIE DEPENDABILITY AND OUTPUT



When production cannot fail, Dixie Hammermills get the call. That's why the Aluminum Company of America, in its magnificent all-out effort to produce more and more aluminum, is using Dixie Hammermills exclusively for all of its crushing needs.

Another important fact is that today 98% of all bauxite produced in this hemisphere is crushed by Dixie Hammermills. Steady production of uniform high quality, even on wet, sticky material, is the basis of Dixie's superiority and the reason for their choice when production cannot fail.

Write for Free Booklet, "More Efficient Crushing of Raw Materials."



DIXIE NON-CLOG HAMMERMILLS

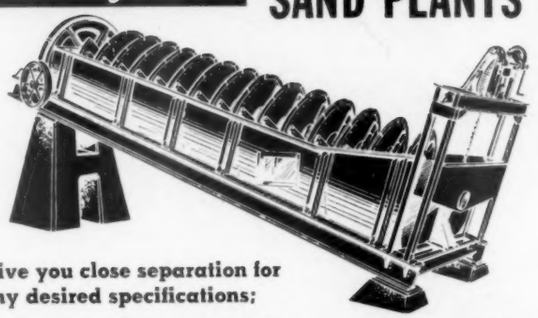
★

Crush • Grind Pulverize • Shred •

DIXIE MACHINERY MFG. CO.

4202 Goodfellow Blvd., St. Louis, Mo.

AKINS Classifiers HAVE MARKED ADVANTAGES FOR SAND PLANTS



1. **Give you close separation for any desired specifications;**
2. **Big tonnage - low power cost;**
3. **Start without unloading -- very important if you run less than 24 hour shifts;**
4. **Mechanical simplicity.**

Simplex or duplex - 16" (spiral dia.) up. Write for Bulletin 24 HA and state your specific sand washing problem.

COLORADO IRON WORKS CO.

Main Office & Works - Denver, Colo., U. S. A.

GENERAL

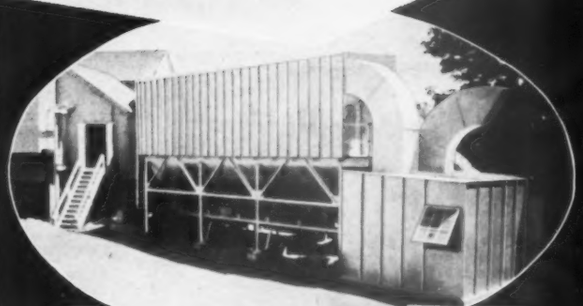
GIVES YOU MORE!

Let us explain how and why— when you next need a Shovel, Dragline, Crane or Clamshell.

The GENERAL EXCAVATOR CO.

MARION, OHIO

WIPE OUT the PLAGUE OF ALL PLANTS DUST and DIRT



PARSONS OVAL BAG
DUST ARRESTORS

In rock crushing plants, cement plants, etc., Parsons Oval Bag Arrestors not only harness the dust and dirt thereby protecting employees, equipment and plant but out of the fines they produce cash profits. In many, many cases these profits actually pay for the Parsons installation in a very short time. While they are licking the dust and dirt problem in your plant they are also producing profits, serving a twofold purpose and obtaining amazing results in both.

Persons Oval Bag Dust Arrestors were designed by a staff of engineers who for years have specialized in the problems of dust and dirt. Loaded with many exclusive Parsons features they enjoy an enviable international reputation, gained solely on their outstanding performance, trouble-free operation and unusually long life.

Write for our new free bulletin "Mastery of The Air" which gives you detailed information on Parsons "Ovals".

PARSONS
ENGINEERING CORPORATION
CLEVELAND, OHIO

THIS IS NO TIME FOR *DELAY*

TODAY America is calling for swift action . . . increased production. Waste motion must cease.

At this time, more than ever, the entire excavation industry will seek ways to S-P-E-E-D work on Island Bases, Cantonment Construction, Air Bases, etc.

Again, we call to your attention the oft-proven fact that Page AUTOMATIC Dragline Buckets will OUTDIG ANY OTHER BUCKET of equal size and weight!

In the interest of greater speed and increased production on YOUR JOB and with YOUR MACHINE . . . get the facts about a Page Bucket. Fill in the coupon below and MAIL IT TODAY!

PAGE ENGINEERING CO., CHICAGO, ILLINOIS

★ BOOST PRODUCTION ★
KEEP AMERICA STRONG

PAGE *Automatic* DRAGLINE BUCKETS

Address this Coupon to: DEPT. C-1, PAGE ENGINEERING COMPANY, c/o Clearing Post Office, Chicago, Ill.

Without obligating me in any way, mail a copy of your new descriptive bulletin entitled "Your Dragline WILL Move Dirt Faster."

*Name*_____

*Street*_____

*City*_____ *State*_____

Faster Footage-

THE demand of victory construction means you've got to get out a lot more stone this year. And for drilling more footage faster, you'll find the *extra* power and speed you need in Gardner-Denver rock-drilling equipment. Gardner-Denver UM-99 Wagon Drills and S-73 Sinkers have powerful rotation and strong blowing capacity that enable them to drill more footage per shift. Because of their low air consumption and minimum maintenance requirements, they effect sizeable reductions in operating cost. For complete specifications write Gardner-Denver Company, Quincy, Illinois.

● *Gardner-Denver UM-99 Wagon Drills handle 6-foot steel changes—are easily moved over rough ground—are fully adjustable for down holes, toe holes, or line drilling.*

● *Gardner-Denver S-73 Sinking Drill—67 pounds of speed and power, yet uses no more air than the average 55-pound drill—has powerful 4-pawl rotation and excellent holding characteristics.*

Sizeable Savings!

GARDNER-DENVER PRODUCTS SPEED VICTORY

Since 1859

GARDNER-DENVER

Solve SHORTAGES-HIGH PRICES

In essential materials used in tremendous volume by the building industry.

WE EQUIP YOU with special line production machinery—using local low-cost raw materials—only modest investment required—balance easy monthly payments.

SCORES OF ESTABLISHED MANUFACTURERS have proven the quality and salability of product, as well as the earning power and stability of this business. (Names on request.)

THIS OPPORTUNITY IS EXCLUSIVE and is based on the manufacture and sale of proven low-cost materials. (Samples furnished.)

ACT NOW while your territory is still open. Write or wire for Free Books.

W. E. DUNN MFG. CO.

420 W. 24th St. Holland, Michigan

RESULTS . . .

not promises!

Leadership isn't something that can be promised for, or argued into, a concern . . . or a magazine. Leadership must be earned and won. Pit and Quarry has attained that leadership in its field by giving readers and advertisers alike what they demand in an industrial publication. As a result, Pit and Quarry leads in *total circulation* and *producer circulation* . . . in *advertising volume* and *reader preference.*

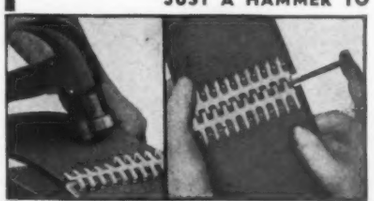
Follow a leader . . . subscribe for . . . advertise in

PIT AND QUARRY

KEEP YOUR BELTS RUNNING

1. Inspect your belts and fastenings frequently.
2. If you find that the lacing is badly worn and the belt joint is badly frayed or worn relace the belt with Alligator Steel Belt Lacing.
3. Don't throw worn belting away. Worn belting can be reconditioned or you can easily make up a serviceable belt by cutting out the best sections of old belts and then splicing them together with Alligator Steel Belt Lacing.
4. Be sure and use the size of Alligator Steel Belt Lacing recommended for the thickness of belt to be spliced.
5. Where belts are to be laced that are wider than the standard lengths of 6, 8 or 12 inches, Alligator Belt Lacing is available in continuous lengths for any width of belt. The continuous length is easier to apply and makes a more uniform and longer lasting joint.
6. Write for our Bulletin A-60 that gives complete details on how to lace flat belts of leather, rubber, balata, canvas, from 1/16" to 5/8" thick and as wide as they come.

JUST A HAMMER TO APPLY IT



• Lacing can be applied right at the location of the belt without even taking the belt off the line shaft. Alligator has strength with long life, compression grip, is smooth on both faces and the joint is easy to take apart at any time regardless of the amount of wear.

FLEXIBLE STEEL LACING CO., 4623 Lexington St., Chicago

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING

For more than 30 years the most universally used steel belt lacing in the world.

LOW-COST ACCURATE SCREENING

• Screening equipment is of first importance to National Pulverizing Co., Millville, N. J., whose product—silica sand—is accurately graded to seven sizes. Starting 15 years ago with 8 Link-Belt vibrating screens, they have since purchased 7 additional units. As in numerous other installations, Link-Belt vibrating screens have shown the way to accurate separation and lowest operating cost. The whole story of their economy and smooth, trouble-free operation is given in Book No. 1762. Send for a copy today.

LINK-BELT COMPANY 8694
307 N. Michigan Avenue, Chicago

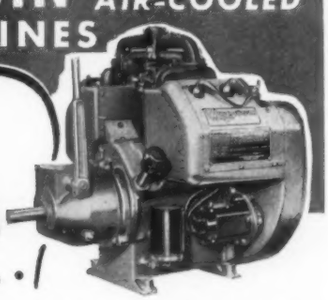
WRITE TODAY! **LINK-BELT Vibrating Screens**

DEFENSE *Against* WEAR

The 14% manganese-steel dragline-bucket dipper tooth shown at the left was protected against wear by a coating of Coast Metal No. 112 on its exposed faces. After having given several times the normal service expected from an uncoated tooth, it has been removed to receive another application of Coast Metal. Note how the beads of Coast Metal have stood up under severe service. Parts and equipment are becoming increasingly hard to get . . . let Coast Metals give your present machinery a new lease on life. Get all the facts now!

COAST METALS INC. Canton, O.

WISCONSIN HEAVY-DUTY AIR-COOLED ENGINES



In Step with TODAY'S INCREASED PRODUCTION DEMANDS . . .

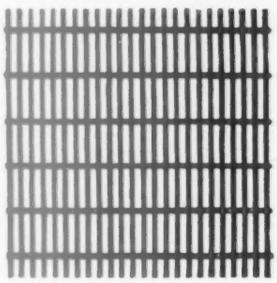
In war service and in essential industries, both men and machines have to deliver MORE today than ever before. The ability to OUT-DO and OUTLAST the job that is to be done; the inbuilt capacity to keep on "taking it", no matter how tough the going . . . is a prime requisite to winning this war.

It is because Wisconsin heavy-duty AIR-COOLED Engines (1 to 35 hp.) have this characteristic to a marked degree . . . that they can help YOU keep step with the insistent and necessary demands for *increased productive capacity*. You can *depend* on Wisconsin Engines . . . supplied as standard power equipment by more than 300 machine manufacturers . . . in your industry as well as in many others.

WISCONSIN MOTOR Corporation

MILWAUKEE, WISCONSIN, U. S. A.

World's Largest Builders of Heavy-Duty Air-Cooled Engines



Rolled Slot

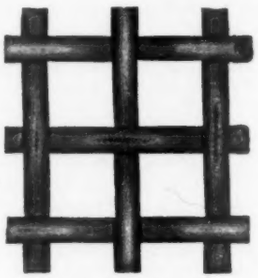
ALLOY No. 2

A super wearing Steel developed to resist the abrasion and vibration of modern screening demands.

"CLEVELAND" SCREENS

A wire cloth of guaranteed accuracy backed by fine workmanship and an effort to satisfy.

Available in Square Mesh and Rolled Slot. A trial will convince you of the superiority.



2 Mesh .162 Ga.

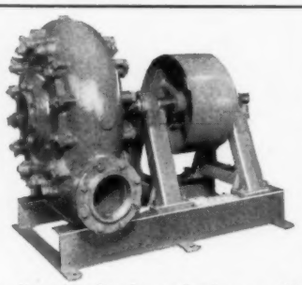
THE CLEVELAND WIRE CLOTH & MFG. COMPANY
574 E. 78th St. CLEVELAND, OHIO

The Lightning

Sand and Gravel Pumps

HEAVY-DUTY
(Ball-Bearing)
and Low Head Types

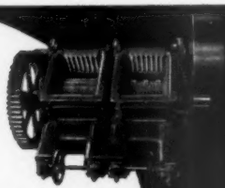
Complete stock of replacement parts, elbows and fittings carried for prompt shipment.



Replacement parts made to jig standards and always fit and always available.
For 30 years LIGHTNING pumps have faithfully performed the work they are intended for. We manufacture a type and size to fit the need. Simplicity of design and ease of handling have made these pumps one of the most popular. Write for catalog now.

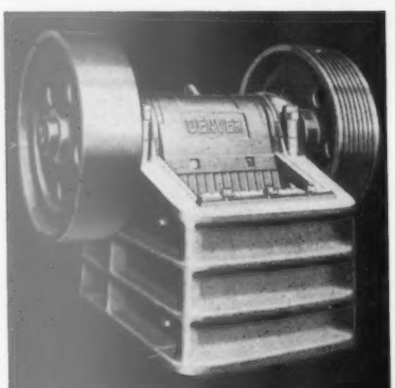
Mfg. by
KANSAS CITY HAY PRESS CO., KANSAS CITY, MO.

McLANAHAN EQUIPMENT
for ROCK—SAND—GRAVEL



Single and double roll and jaw crushers, hammer mills, super dry pans, steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, hoists. Complete portable, semi-portable and stationary crushing, screening and washing plants for different capacities of any materials.

McLanahan & Stone Corporation
Established 1835
Hollidaysburg, Pennsylvania



DENVER JAW CRUSHERS

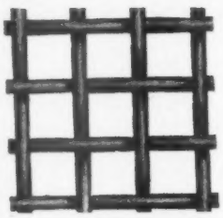
The Denver Forced Feed Jaw Crusher is simple and has but few wearing parts. It is well adapted to coarse and fine crushing due to the forced feed principle. Rugged construction is used throughout including ribbed reinforced frame, chrome-steel eccentric shaft, roller bearings and heavy reinforced steel jaw bumper. Jaws are of manganese steel and are reversible. Bulletin No. C12-B describes bronze bearing crushers and Bulletin No. C12-B1 anti-friction bearing crushers

Denver Equipment Co.
1400 Seventeenth Street
Denver, Colorado

New York, N. Y., 50 Church St., Salt Lake, Utah, McIntyre Bldg., Chicago, Ill., 1005, 69 W. Wash., Toronto, Ont., 45 Richmond St., Mexico, D. F., Edificio Jalisco

---

BUSY DAYS AHEAD!



There'll be little time for breakdowns and delays in your aggregate production.

Make sure **now** that you are equipped with woven wire screen that stands the "gaff" under the toughest runs.

TWIN CITY SCREEN
It's Abrasion Resistant—Accurate—
Longer Wearing!

ORDER YOUR "TWIN CITY" SCREEN TODAY

TWIN CITY IRON & WIRE CO.
31 W. WATER ST. ST. PAUL, MINN.
Write for Catalog No. 39

ROUND
SQUARE
SQUAROUND*
HEXAGON
PERFORATED PLATE
of every description
for maximum productiveness from your vibrating screens.
*Reg. U. S. Pat. Off.

HENDRICK MANUFACTURING CO.
39 Dundaff Street, Carbondale, Pa.
Sales Offices in Principal Cities. Please Consult Telephone Directory

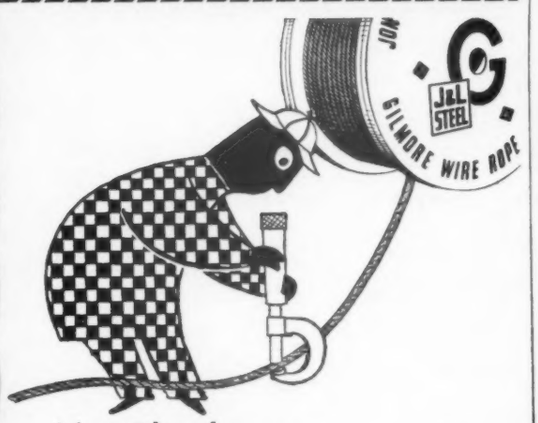
---

DOUBLES
THE LIFE OF CONVEYOR BELTS!

The most profitable investment in conveyor equipment! A pulley that saves at least 50% on conveyor belts! This exclusive Sprout-Waldron development prevents material from coming between the face of the pulley and the belt . . . eliminates the heavy friction wear and punching of holes. Interchangeable with standard pulleys. *Write for list of sizes available.*

SPROUT, WALDRON & CO., INC.
136 SHERMAN ST. MUNCY, PA.

ELEVATORS, CONVEYORS, POWER TRANSMISSION EQUIPMENT



Mr. Check says:

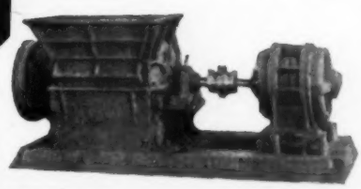
"J&L PERMASET Pre-formed Wire Rope is always uniform."

J&L WIRE ROPE

JONES & LAUGHLIN STEEL CORPORATION
AMERICAN IRON AND STEEL WORKS
GILMORE WIRE ROPE DIVISION • PITTSBURGH & MUNCY, PA.

AMERICAN

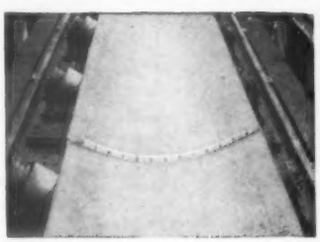
For producing agricultural stone .... for reducing any one of a wide range of materials .... AMERICAN Hammermills and Ringmills get first call from experienced producers. Low-cost operation, uniformity of product, unbelievable endurance are AMERICAN by-words. Bring your crushing and grinding problems to us.



AMERICAN Pulverizer Co.
1059 Macklind Ave.
ST. LOUIS, MO.

Talcott Belt Fasteners

FOR CONVEYOR ELEVATOR AND TRANSMISSION BELTING



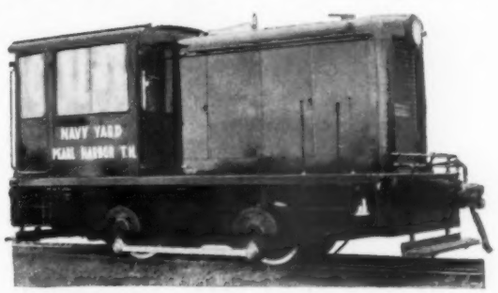
BELT MAN LUKE *Says:*

for SAFETY
STRENGTH
and
ECONOMY
Insist on
TALCOTT
the
EASY FASTENER
TO APPLY

Send for Samples

W. O. & M. W. TALCOTT, Inc.
92 SABIN ST., PROVIDENCE, R. I.

PEARL HARBOR
BIRTHPLACE OF UNITY



STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

DAVENPORT LOCOMOTIVES Builders to the World

As one man the people of America have dedicated themselves to an all-out march toward Victory. Such is the miracle of Pearl Harbor. We of Davenport are completely engrossed in the task of producing power units for our Army and Navy, our Allies, American war industries, American railroads and American builders of production facilities. The traditional dependability of Davenport Locomotives, established on a world-wide scale during more than forty years, is now enlisted for the duration—and for the Victory tasks of the Peace to follow. Rely on Davenports for those VITAL JOBS.

EXPORT OFFICE **BROWN & SITES** 50 Church St., N. Y. Cable Add. "Brosites"

STEAM—GASOLINE—DIESEL LOCOMOTIVES—ELECTRIC OR MECHANICAL DRIVE

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA

2 - CHICAGO PNEUMATIC DIESEL DRIVEN

AIR-COMPRESSORS

CAPACITY 1000 Cubic Feet Per Minute

Compressors—19x11x10 Two Stage Vertical

Type V 3 Step Unloaders

Engines—5 Cylinder 200 H. P. Type RHA 40

Complete with Air Receivers and all auxiliary equipment

Phone
Calvert 2254

ARTHUR D. SAMLER, INC.
219 W. Pratt St. Baltimore, Md.

NEW AND USED EQUIPMENT FOR IMMEDIATE SHIPMENT

Subject to prior sale

NEW—32" Cage Mill, 3 to 4" feed rock or gravel, good for maximum 50% crushing, 40 to 60 tons per hour.
NEW—Steel Truck and Wheels, equipped with new pneumatic tires, tongue for tractor hitch, 10-ton capacity, for mounting 40x20" rolls or 15"x36" crusher.
USED—9"x16" RELIANCE Jaw Crusher, good condition.
USED—Model 101 Type K DAY Limestone Pulverizer, 2 to 3 tons capacity.
USED—No. 7 MITTS & Merrell Wood Hog, plain bearing, 14"x14" hopper opening, capacity 5-tons per hour.
USED — 24" x 18" LIPPMAN Portable limestone Pulverizer, with 14' elevator, in excellent condition.
USED—15"x24" GRUENDLER All Steel Blake Type Jaw Crusher.
USED—SCHUTTE Type F, Model L, Hammermill with or without fan for sawdust, oyster shells, etc., in excellent condition.
USED—GRUENDLER light type, 3'x8' single deck Vibrating Screen.
USED—GRUENDLER 30"x12" sawdust, oyster shell or fertilizer Grinder, slow speed.
USED—50-16 SUPREME (GRUENDLER) Hammermill for sawdust, oyster shells, bones or fertilizer.
One (1) Factory re-conditioned LeRoi RA2P 65-HP gasoline power unit.

STATE FULLY YOUR REQUIREMENTS

GRUENDLER CRUSHER & PULVERIZER COMPANY
2915-2917 North Market Street
St. Louis, Missouri

CONCRETE EQUIPMENT

Ready-Mix Blaw-Knox concrete plant, complete, large size, splendid condition, unusual opportunity; specifications furnished.
Heltzel bin, 225 ton, 4 compts., weigh batcher.
Blaw-Knox complete ready mix concrete plant.
Butler 100 yd. 3 compt. bin, weigh batcher.
200 ton rock storage bin, steel, heavy construction.
Fuller Kinyon bulk cement unloader, portable.
Fuller C40 rotary air compressor, electric.
Ransome 28-S 1 yd. Stationary mixer, elec.
Ransome Dual drum paver 27E.
Barber-Greene Model 62 loader, cats.

SPECIALS!!
48" x 60" Traylor Jaw Crusher.
Allis-Chalmers cent. pump, electric, 3500 GPM, 50' head.
100 HP. vertical boiler, new 1940, complete.
20,000 gals. oil tanks with heating coils.
I.R. Air Compressor, 310 cu. ft. gas, portable.
I.R. Air Comp. 315 cu. ft., 2 stage, gas, port.
Sullivan Air Compressor 1051 cu. ft. F-Morse oil engine.
Suillivan Air Comp. 110 cu. ft., gas, port.

BUCKETS—STONE SKIPS
22—Steel stone skips, 2 to 3 yds.
1 yd. Hayward rehandling, clamshell.
Haiss 1 yd. rehandling clamshell.
2—½ yd. Haiss rehandling clamshell.
¾ yd. Haiss rehandling, clamshell.
1 yd. Hayward orange peel, 4 leaf.
¾ yd. Hayward orange peel, 3 leaf.

SHOVELS—CRANES
Bucyrus Erie Model 1030 electric tunnel shovel.
2—Marion Diesel shovels, 1¾ yd. cap.
No. 50-B Bucyrus-Erie electric shovel, 2 yds.
Link-Belt Crane, gas, 50' boom, 1 yd. cap.
Brownhoist Crane, gas, 40' boom, 1 yd. cap.
Lima Model 101 Crane, Dragline, Shovel, 1¼ yd.
General Crane and Backhoe, 40' boom.

LOCOMOTIVES—CARS
2—Vulcan 6 ton, gas, 36" gauge.
2—Whitcomb 4½ ton, gas, standard gauge.
8—3 yd. V type 36" ga. side dump cars.

CRUSHERS—PLANT
Gyratory crushers: K.V.S. 30, 37-S, 49; Telsmith 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".
Jaw: 6x12, 9x16, 10x20, 12x26, 13x30, 15x30, 16x32. 36x48, 48x60.
Symons 4' cone Crusher, complete.

RICHARD P. WALSH CO.
30 Church St. New York, N. Y.

---

12 Ton Whitcomb Locos.—Gas, 36" Ga.
8 Ton Plymouth Locos.—Gas, Std. & 36" Ga.
7 Ton Whitcomb—Gas, 24" Ga.
14 Ton Vulcan Locos.—36" Ga. Steam.
1¼ Yd. Northwest Shovel attachment.
1¼ Yd. Bucyrus Erie 41B Shovel attachment.
Barber-Greene 42 Bucket Loader.
Erie B-2 Steam Crane, ¾ Yd.
40 Ft. Crane Boom, Erie.
15-Ton Steel Guy Derricks, 100' boom.
Electric Hoists—50, 60, 100 HP.
3 Inch Centrifugal Pump, 75 ft. head, 40 HP. elec. motor.

J. T. WALSH
Brisbane Building Buffalo, N. Y.

USED SPEED REDUCERS

All Types—Sizes up to 300 H.P.

Falk—Link Belt—James—Cleveland, Etc.

CONVEYING EQUIPMENT
Save 60% of New Net Costs

All Materials, Overhauled, Guaranteed

Immediate Delivery

PATRON TRANSMISSION CO.
154 GRAND ST. NEW YORK

! ! FOR SALE OR RENT ! !

AIR COMPRESSORS
2—INGERSOLL-RAND 315 cu. ft. capacity, 2-stage mounted on rubber tires.
1—INGERSOLL-RAND 105 cu. ft. capacity, 2-stage, mounted on pneumatic tired truck.

CRANES, SHOVELS & DRAGLINES
1—LITTLE GENERAL Combination Shovel and Crane. Gasoline. Shop No. 1233.
1—KOEHRING Model 401 Combination Crane, Shovel and Dragline. Gasoline. Shop No. 1380.
1—KOEHRING Model 376 Combination Crane & Shovel, Gasoline. One cu. yd. capacity. Shop No. 1680.
1—43-B BUCYRUS-ERIE Dragline. Gasoline, with 50 ft. boom. Shop No. 11604.
1—55-B BUCYRUS-ERIE DRAGLINE & CRANE. Diesel operated, 80 or 110 ft. boom. 80 ft. boom handles 2½ yd. bucket. Shop No. 11965.
1—P & H Model 900 Diesel Shovel with 3 yard dipper. Shop No. 3842.

SHOVEL ATTACHMENT
1—301 KOEHRING ¾ Yard Dipper.
1—401 KOEHRING 1 Yard Dipper.
1—No. 5 NORTHWEST. 1¼ Yard Dipper.

CONCRETE MIXERS
2—RANSOME Stationary Mixers Mod. 42-S 1½ cu. yd. cap. Electric powered. Right and left type.

HAMMERS
1—VULCAN No. 1 Pile Hammer. McDermid Base. Shop No. 1125.
1—McKIERNAN TERRY Model 10B-3. Shop No. 8465.

TRACTORS
1—ALLIS-CHALMERS Model HD-10 Diesel with General Motors Engine. Complete with Baker Bulldozer, operated only 130 hours. 1941 Model.
1—CATERPILLAR Model 70 with 12 cu. yd. Caterpillar Bottom Dump Wagon.

ATLANTIC EQUIPMENT CORP.
50TH AND GRAYS AVE., PHILADELPHIA, PENNA.
Tel. Evergreen 6363

FOR SALE

LOCOMOTIVE CRANE
1—35 Ton Brownhoist No. 6, 8 wheel steam, 55' spliced steel latticed boom, complete, excellent condition, inspection here, immediate delivery.

OVERHEAD ELECTRIC TRAVELING CRANE
1—25 Ton Whiting, 50' span, 3 motors, 220-3-60, cab control, fishbelly girders, good condition, located Greensboro, North Carolina; immediate delivery.

GEORGE M. MERIWETHER
Industrial Equipment
606 Farley Building
BIRMINGHAM, ALABAMA

FOR SALE

70 H.P. Cummins Diesel.
120 H.P. F-M Diesel Generator.
24" x 20" Jeffrey Pulverizer.
8B Telsmith Gyratory Crusher.
36" Gyratory Crusher.
¾ yd. Electric Shovel.
50 B Bucyrus Dragline, Diesel.

JOHNSON MACHINERY CO.
310 Keystone Ave. River Forest, Ill.

WANTED

Suction or Clam Shell Dredger, Dredger Pipe, also Machinery and all Kinds of Equipment.

WESTERN DREDGING & EQUIPMENT CO.
1911 Grove St. Oakland, Calif.

FOR SALE

160 H.P. Murphy Diesel Engine No. 1173—with extended shaft including clutch, 12 groove and 7 groove sheaves about 14" P.D. Complete with radiator, electric starter, batteries, and base. Good condition. Immediately available.

COOLEY GRAVEL COMPANY
Townsend, Montana

LIQUIDATION

1—5 Roll Raymond High Side Mill, No. 50-57, latest type, with oil journals. Exceptional condition.
1—Blaw-Knox 6'x12' Brand New Ball Mill, motor driven.
9—Rotary Dryers, 7' and 5'x60', 8'x 60', 8'x110'.
1—Raymond 3 Roll High Side Mill.
2—Louisville Dryers 6'x26'.
1—Williams 2XX Hammer Mill.

2—Belt Conveyors 16"x50' and 56'.
6—Gould Pyramid Pumps 2" to 4".
1—Allis Chalmers 5'x22' Compeb Mill.
2—Jeffrey Hammer Mills 24"x20", 24"x 18".
1—Link Belt 3'x8', 2 deck Vibrating Screen.
1—Tyler 3'x5', 2 deck Vibrating Screen.
2—Sutton, Steele and Steele Pneumatic Tables.
1—Allis Chalmers 9"x15" Jaw Crusher.
1—Plymouth Gas. Locomotive, 6 ton, 36" ga.
4—Williams, Gruendler Hammer Mills.

"Buyers of your surplus equipment—from a single item to a complete plant."

BRILL EQUIPMENT CORPORATION
183 Varick Street, N. Y. C.

NO DIAMOND IS "SECOND HAND"

The same diamond is bought and sold many times; yet it is never regarded as "second hand" because it continues to perform its function of being beautiful, just as it did when new. Likewise E.C.A. equipment is not regarded as "second hand"; because it is REBUILT and RE-GUARANTEED to properly perform its functions. Yet it costs far less than new equipment.

AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

BINS

4—1—150-ton Blaw Knox; 1—35-ton Blaw Knox; 2—30-ton Johnson. Above with or without weight batchers. All of the above are 2 comp. bins.

CABLEWAYS

1—Lidgerwood 15 ton cap. cableway, 2300' span, with Lidgerwood 12¼x15 steam hoist, with or without steel towers.

CONVEYORS

13—Portable troughing, and flat belt type with cleats, 1—12"x18'6"; 1—24"x 22'; 3—24"x40'; 1—14"x25'; 1—24"x50'; 1—18"x32'; 1—24"x30'; 1—18"x50'. National, Barber Greene, Stephens Adamson, Portable Machinery and Farquar.

CRANES, DRAGLINES AND SHOVELS

1—Link Belt K-55, ser. No. 1698, 70' boom, 2 yd. bucket, also have a 2 yd. shovel attachment.
1—Link Belt K-48, ser. No. 1728, 60' boom, 2 yd. bucket.
1—Northwest Model No. 5, Serial No. 3572. 50' boom with 1¼ yd. pull shovel attachment.
1—Link-Belt model K-42, ser. No. 1265. 45' boom, 1¼ yd. bucket, also 1 yd. trench hoe att. or 1¼ yd. shovel front.
2—Northwest Model 104, ser. Nos. 2079, 1386. 45' boom, 1¼ yd. bucket; with 1 yd. shovel attachment.
3—Northwest Model No. 4's, ser. Nos. 3441, 3445, 3493, with 40' boom and 1 yd. pull shovel attachments.
2—Northwest model 105, ser. No. 1645, 1522, 40' boom, 1 yd. bucket.
2—Osgood Heavy Duty, ser. Nos. 2069 and 2087, 40' boom, 1 yd. bucket and with 1 yd. shovel attachment.
2—Erie gas-air ser. Nos. 4365 and 9758 with 45' boom and 1¼ yd. shovel attachment.
1—Osgood "Commander," ¾ yd., ser. No. 2403, with 30' boom, ¾ yd. bucket.
1—Thew ¾ yd. gasoline shovel with ¾ yd. shovel front and 40 ft. crane boom. Serial No. 2801.
1—Koehring Model 301, ser. 544, 40' boom, ¾ yd. bucket.
1—P&H Model 206, ser. No. 1901, ¾ yd., 40' boom.
1—Byers Bearcat model 27, ser. No. 5289, 30' boom, ½ cl. sw. ½ yd. bucket.
1—Erie Steam Crane, ¾ yd., 40' boom.

CRUSHERS

4—Jaw Crushers: 1—12"x20" Acme; 1—10"x20" Climax; 1—9"x16" Acme; 1—2"x6" Sturtevant.
2—Gyratory Crushers: 1—No. 5 Allis-Chalmers; 1—No. 5 Austin.
1—Crushing Rolls: Size 42"x16" Allis-Chalmers.

PUMPS (DREDGE)

2—10" Morris Dredge pumps, 1 to direct connect to motor, other belt drive.
4—Belt driven: 3 Morris Mang., 1—8", 2—6"; 1—8" Cataract.

LOCOMOTIVES

30—Locomotives, gas, electric and steam, 2 to 20 tons, 24", 36" and standard ga.

PUMPS (DREDGE)

2—10" Morris Dredge pumps, 1 to direct connect to motor, other belt drive.
4—Belt driven: 3 Morris Mang., 1—8", 2—6"; 1—8" Cataract.

PNEUMATIC TOOLS

36—Rock Drills, mounting, wagon, column or tripod.
53—Jackhammers, various makes and sizes.

CHICAGO 1160 S. Washtenaw Ave.
PHILADELPHIA 1513 Race St.
PITTSBURGH P. O. Box 933 Dept. PQ
NEW YORK 30 Church St. Dept. PQ

EQUIPMENT CORPORATION of AMERICA

FOR SALE

1—48-Ton 0-6-0 Baldwin Fireless Loco. Built 1922. Good condition.
1—25-Ton 0-4-0 Davenport Loco., S. G. Immediate Delivery.
1—25-Ton Baldwin Gasoline Loco. First-class condition.
2—60-Ton 0-6-0 S/T Switching Locos. Coal-burners. Excellent condition.
1—19-Ton 0-4-0 Davenport Saddle Tank Loco., S. G. Good condition.
1—38-Ton 0-4-0 American Loco., S. G. Saddle Tank.
1—42-Ton 0-4-0 Baldwin Loco., S. G. Saddle Tank.
1—50-Ton 0-6-0 Baldwin Loco., S. G. Separate Tender.

SEND US YOUR INQUIRIES FOR ANY KIND OF LOCOMOTIVES
37 years' experience

IRON & STEEL PRODUCTS, Inc.
13490 S. Brainard Ave., Chicago, Illinois
"ANYTHING containing IRON and STEEL"

FOR SALE

DREDGING OUTFIT—

6 In. Morris K. 66 H.P. Wisconsin Gasoline Engine Driven Pump.

800 Ft. 6 In. SPIRAL PIPE.

1½ Yd. CLAMSHELL BUCKET.

18000 Gal. GASOLINE TANK.

½ Yd. SPEEDER, 30 Ft. BOOM CAT. CRANE.

4 x 8 ROBINS 2 DECK VIB. SCREEN.

R. C. STANHOPE, INC.
60 E. 42nd St. New York, N. Y.

4' Symons Cone Crusher.
10" Newhouse Gyratory Crusher with Motor.
79 HP. Elec. Sauerman 2 D. 2 Speed Hoist.
8" x 36" Jaw Crusher.
Page 220 Elec. Dragline 70' Boom.
27 E. Foote Gas Paver.
8 x 4 Ton Plymouth Gas Locos.
150—265 x 300 HP. Diesels.
¾ Yd. Thew Gas Crawler Shovel.
2 Yd. Sauerman Slackline Cableway.
½ Yd. General Gas Crawler Shovel.
3 Yd. Crawler Dragline.
10 Ton 3 Wh. Gas Rollers.

We have all kinds of equipment.
Let Us Know What You Want

THE T. J. LANE COMPANY
Box 665
Springfield, Ohio

Jaw Crushers—4"x8" up to 66"x84".
Crushing Rolls—16"x10" up to 54"x24".
Gyratory Crushers—No. 3 up to Mammoth.
Ring Roll Mills—No. 0, No. 1, No. 1½ and No. 2.
Swing Hammer Mills.
Rotary Fine Crushers—No. 0, No. 1, No. 1½ and No. 2.
Direct Heat Rotary Dryers—3½'x25', 4'x30', 5'x30', 5½'x40', 6'x50', 7'x50' and 8'x50'.
Semi-indirect heat Dryers — 5'x30' and 8½x 75'.
Cement Kilns—3' up to 8' diameter.
Hardinge, Marcy & Fuller-Lehigh Mills.
Raymond Mills—No. 00, No. 0, No. 1, No. 2 Roll.
2—6'x12' and 1—4'x10' rod mills.
Tube—Rod and Ball Mills—3' to 6' diameter.
Vibrating Screens—Air Separators.
1—4'x4' and 8'x6' ball mills.
New Dryers built for all purposes.

W. P. HEINEKEN
277 Fulton St., N. Y. Tel.: Barclay 7-7298

REBUILT AND NEW

DERRICKS—Guy, wood and steel, 34-40' boom.
HOIST—Clyde 2 drum and swinger, 35 hp.
PUMP—Diaph. 4" TAR POT, torch and tank.
MIXER 10s, barrows and carts, pneu. tires.
COMPRESSOR—Gardner twin 4½x4½, 15 hp.
SULLIVAN BREAKER and tools AIR TAMPER.
BOILER—Horiz. 20 hp., steel skids, fittings and hose.
PUMP SUCTION HOSE 1½" and 5", pipe extensions.
GUY CABLE ½"-¾" Cable Tighteners—Crosby Clamps.
HOISTING BLOCKS—Mnl. rope and cable; Sheaves 16"
STEEL MATERIAL BUCKETS, ½ yd.; Track Jacks.
SKILSAW "77", electric; Form Clamps—lever, wire.

R. J. LUNDGREN
405—51st St. Des Moines, Iowa

For Sale

Ingersoll-Rand Air Compressor Model 75-CH powered by Caterpillar Diesel D-11000 engine, capacity 420 C.F.M. This piece of equipment has been completely overhauled.

H. W. Taylor Company, Inc.
445 North Pennsylvania Street, No. 302
Indianapolis, Indiana

HOIST MOTOR
150 H.P. 690 RPM. 3/60/2200, General Elec. ITC.
SQUIRREL CAGE MOTORS
200 HP. 600 RPM. 3/60/440, Ideal two bearing.
300 HP. 600 RPM. 3/60/440, Ideal two bearing.
SLIP RING MOTORS
150 HP. 600 RPM. 3/60/220, General Elec. IM.
200 HP. 600 RPM. 3/60/2200, Burke.
400 HP. 514 RPM. 3/60/2300, Westinghouse CW.
AIR COMPRESSOR
9x8 Gardner horizontal, 173 CFM. 100 lbs., 300 RPM.
AC GENERATOR
360 KVA. 360 RPM. 3/60/220, Westinghouse.
LEATHER BELT
3 ply leather belt, 37½" wide, 42 feet long.
CENTRIFUGAL PUMP
12" Cameron double suction 4170 GPM. 170' head arranged for direct connection to motor.

ROCKFORD ELECTRIC EQUIPMENT CO.
726 South Wyman St. Rockford, Illinois

FOR SALE

1—Model 2 NORTHWEST Shovel & Crane.
1—Model 40 LORAIN Dragline.
1—Model 104 NORTHWEST Crane.
1—Model 105 NORTHWEST Crane.
1—1 Yd. Rehandling Bucket.
1—18x24 Roll Crusher.
1—936—CEDARAPIDS Jaw Crusher.
1—920 CEDARAPIDS Port. Gravel Plant.
1—65 HP. Double Drum Gas Hoist.
1—Model 60 CATERPILLAR with Cable type Bulldozer, 5 Yd. AUSTIN CARRYALL Scraper, and 12' ADAMS Pull Grader.

One complete Gravel Crushing & Screening Plant consisting of—Plate Feeder & Hopper; Portable Feed Conveyor; 936 CEDARAPIDS Portable Jaw Crusher with Revolving Screen and Bucket Elevator Return; Delivery Conveyor; 15 Yd. Steel Jack-leg Bin; Model 128 BYERS Full Revolving Crane and ½ Yd. OWEN Bucket. Gasoline powered. Can be inspected operating. Available immediately.

PATTERSON EQUIPMENT COMPANY
1468 WEST 9TH ST. CLEVELAND, OHIO

1—36"x48" Buchanan Jaw Crusher.
1—24"x36" Farrel Jaw Crusher, Type 15B.
1—15"x30" Farrel Jaw Crusher.
1—13"x24" Farrel Jaw Crusher.
1—11"x22" Climax Jaw Crusher.
1—20"x50" Champion Jaw Crusher.
1—No. 37 Kennedy Gyratory Crusher.
1—No. 19 Kennedy Gyratory Crusher.
1—No. 40 Telsmith Gyratory Crusher.
1—3' Traylor Finishing Crusher.
1—2' Telsmith Cone Crusher.
1—1¼ Yd. Lime Shovel.
1—42"x36" Type B Jeffrey Hammermill.
1—Asphalt Plant, complete with Dryer, Mixer, Bins, etc.

BLUE BALL MACHINE WORKS
Blue Ball, Pa.

FOR SALE

IMMEDIATE DELIVERY

All Steel Welded Elevator Buckets of Any Size—Made of ⅛" or 3/16" Plates.

C. L. FIELDER CO.
Roanoke, Va.

FOR SALE OR RENT

17-Ton Cap., **Brownhoist Loco. Crane.**
2—100,000 lb. Cap. **Steel-Underframe Flat Cars.**
1—36"-gauge **Nordberg Track Shifter.**
1—500-ton **Wheel Press, Shop Air Compressor** and other **Shop Tools.**
Dump Cars, Shovels, Draglines and **General Construction Equipment.**

WANTED
10 to 20 ton **PLYMOUTH** 36" gauge **Gasoline Locomotive.**

CLAPP, RILEY & HALL EQUIPMENT CORP.
14 North Clinton St. Chicago

Royal E. Burnham

Attorney at Law

•

Patent and Trade-Mark Causes

•

511 Eleventh Street, N. W.
WASHINGTON, D. C.

REBUILT TRUCK MIXERS

For Rent or Sale
All Sizes
With or Without Trucks

7—2 yd. Separate Engine Drive Truck Mixers, Mounted on Fords and Chevrolet—Good Running Condition, Now Working, Immediate Delivery. PRICE EACH.....$1500

27-E MULTI-FOOTE PAVER
Road Forms—Finishers

THE JAEGER-LEMBO MACHINE Corp.
Corona, N. Y.
Phone: NEwtown 9-7777

CRUSHERS—ELEVATORS—SCREENS
SAND WASHERS—PUMPS—CONVEYORS

1—4"x12" WHEELING No. 2 Jaw Crusher.
1—BRAND NEW Jaw Crusher 9"x15".
1—8"x15" CLIMAX No. 1½ Jaw Crusher.
1—9"x16" CLIMAX No. 2 Jaw Crusher.
3—12"x26" CHAMPION No. 6 Jaw Crusher.
1—Set STURTEVANT Balanced crushing rolls 21"x10½".
2—M-20 QUAKER CITY Hammer Mills.
1—No. 1 STURTEVANT Open Door Rotary.
1—24" wide LINK-BELT Apron Feeder.
Cranes, Shovels, Hoists, Motors, etc. Sales & Service on UNIVERSAL CRUSHER CO. products.

JOHNSON AND HOEHLER, INC.
LANSDOWNE, PENNA.

WE LOOK INTO THE EARTH

By using Diamond Core Drills We Drill for Limestone, Gypsum, Talc, Fire Clay, Coal, and all other minerals.

PENNSYLVANIA DRILLING CO.
Drilling Contractors
Pittsburgh, Pa.

L. H. HOFFMAN, Pres.

DIAMOND CORE DRILLING
HOFFMAN BROS. DRILLING COMPANY
PUNXSUTAWNEY, PA.

We drill for any mineral. We have more than fifty steam, electric and gasoline drills, adapted for any job. Satisfactory cores guaranteed. Our prices are right.
Established 1902 - - - Telephone No. 382

SHOVELS—CRANES

1—Lorain-77 Diesel Shovel 1½-yd. double drums.
1—Lorain 40-A Gas Backdigger, 30" treads, ¾-yd. bucket (for rental only).
1—Lorain-40 Truck-Crane, 4-sp. Mack, pneumatic tires.

GREY STEEL PRODUCTS CO., INC.
74 Central Ave., Glen Rock, N. J.
Tel. Ridgewood 6-2275

FOR SALE

1—Farrell Jaw Crusher, size 20"x10".
2—Rotary Revolving Segment Screens, size 56"x18'.
1—Bucket conveyor, 44 ft. centers with 18" buckets.
1—Belt conveyor, 20" wide, 55 ft. centers. All complete with foot wheels and head wheels.
1—250 H.P. Fairbanks-Morse Slip Ring Motor, 600 RPM, 3 phase, 60 cycle, 2300 volts with secondary drum controller, resistance and panel board with oil switch, type BV.
1—Northwest Caterpillar Crane—40 ft. Boom.
1—Model 60 Caterpillar Tractor with Bulldozer.

Large quantity of Belting and Shafting.

S. GRAF
327 Hewes St. Brooklyn, N. Y.

FOR SALE

1—Ingersoll Rand Two Stage Horizontal Air Compressor, XB Imperial Type 10 Inner Cooler and Air Receiver. 12"x7½"x12" Disp. 327 C.F.M. at 100 lbs. A-1 condition.
1—80 H.P.—A.C.—G.E. Motor with Controls. Complete $1500.00.

SHERIDAN IRON & METAL
704 W. Marquette St. Ottawa, Ill.

FOR SALE

Steel Guy Derrick—$250.00
70 foot Mast—80 foot Boom. Could also be used as Slack line towers.

CROSSWICKS SAND & GRAVEL CO.
Crosswicks, N. J.

FOR QUICK DISPOSAL

3 Complete Diesel Plants Consisting of

2—440 HP. Ruston Hornsby 428 RPM. New.
2—450 HP. Bush Sulzer, 360 RPM. 3/60/480 v.
2—560 HP. Fairbanks, 257 RPM. 600-2300 v.

Also Smaller Units And Separate Engines

STEPHEN A. DOUGLASS CO.
630 Fort Washington Ave., New York

Byers ¾ yard H.D. 90 HP. shovel, WKG, Parsons, Kans. Available 30 Da. Perfect. $4500.00.
Koehring H.D. one yd. shovel. Wisc. Eng. Mod. 3, spent $2500.00 Shp. to Gov. job, west Ark. Little used—available now. $4000.00.
Link-Belt K55 Comb. 2 yd. 80' Drag. Two buckets, 1¾ and 3 yds., 2 yd. Amsco Shovel, bought and never used. Complete $18,000. West. Ill.
Lorain 75A 45' B. Omaha 1¼ drag bucket. First Shape Del. now $6000. NO PRIORITIES NEEDED.
Byers 62, Lorain 37, Sh. Attch. Buda diesel & Wis. gas HD. Power Units.

GEORGE C. KENNEY MACH. CO.
2136 Jefferson St. Kansas City, Mo.

RAILS and ACCESSORIES

RELAYING RAILS—Super-quality machine-reconditioned—not ordinary Relayers.
NEW RAILS, Angle and Splice Bars, Bolts, Nuts, Spikes, Frogs, Switches, Tie Plates, and all other Track Accessories.
Most sizes usually available from warehouse stocks. Every effort made to take care of emergency requirements. **Phone, Write or Wire**

L. B. FOSTER COMPANY, Inc.
PITTSBURGH NEW YORK CHICAGO

FOR SALE

INGERSOLL-RAND COMPRESSOR PARTS

USED PARTS
1—Complete Cylinder for L.P. Side.
1—Complete Cylinder for H.P. Side.
NEW PART
1—H.P. Air Head Frame. For Imperial XB Type 10 Air Compressor. Right Hand Side 37010. Left Hand Side 37009. Size 12x16 and 19x16.

CAMPBELL LIMESTONE CO.
Liberty South Carolina

FOR SALE

MAGNETIC PULLEYS

1—No. B 495628A Type Size 18-18—230 AC line Volts. Never been used.
1—Magnetic Pulley consisting of 16" Belt having GE Motor and GE Direct Current generator. Used only four months.

WARREN BROTHERS ROADS CO.
38 Memorial Drive, Cambridge, Mass.

Consolidated Can Help You Overcome Today's Conditions

ROTARY KILNS

5'x24', 7'x40', 6'x60', 7'6"x125'.

ROTARY KILN SPECIAL

10'x125' Power & Mining Mchry. Co., now Allis-Chalmers. ¾" shell, 14" tires, 16" supporting rolls, 8" roll journals, girth gear, 12" face. Used six months.

ROTARY DRYERS

Indirect Heat: 2—4'x20' Ruggles-Coles Type B-2.
Direct Heat: 5'x30', 6'x40', 6'x50', 6'x60', 7'x60', single shell.
Steam Tube: 6'x35' Louisville.
Atmospheric Truck Dryer: 24 truck Proctor & Schwartz Truck Dryer, 40 trays per truck, 4,166 sq. ft. tray surface, 10,858 lineal feet 1¼" piping, 125 lb. steam pressure in coils.

BALL, ROD AND TUBE MILLS

Tube Mills: 6'6"x22' Hardinge, straight side, iron lined with 300 H.P. direct connected A.C. motor.
2—5'x20' Bonnot silex lined Tube Mills with steel gears and steel heads.
2—6'6"x20' Smidth, silex lined.
5'x22' Allis-Chalmers, iron lined.

HARDINGE CONICAL MILLS

Silex lined: 4'6"x16", 5'x22", 6'x22", 6'x48", 8'x18", 8'x30".
Iron lined: 4'6"x16", 5'x22", 6'x22", 8'x18", 8'x30", 8'x36" with motor; 8'x48" with air classifier; 8'x48"; also 6'x16", with motor and balls.

CRUSHING ROLLS

Single Roll: 30"x30" Jeffrey, 21"x40" and 21"x50" Pennsylvania.
Double Roll: 42"x16" Allis-Chalmers Anaconda type, at Waukon, Iowa. 36"x16" Traylor and Allis-Chalmers.

AIR SEPARATORS

2—10' Sturtevant, 2—14' Gayco, 3—8' dia. Raymond double cone Separators, each with fan, cyclone, piping, etc. Can offer each of these Raymond Separators with 6' Hardinge ball mill.

RAYMOND PULVERIZERS

1—5 roll high side and 3—6 roll low side; also beater type pulverizers in No's. 0000, 00, 0, 1 and 3. Also No's. 60 and 90 Imp type.

STEEL STORAGE TANKS

Horizontal: 28—10x26', 10x36', 8x24'.
Vertical: 10x30', 10x25', 2—8x30', ¾" plate.

VIBRATING SCREENS

2—Sets of Type 39 double deck, 4x5' Tyler Hummers; 4x5', 2-deck; 4x7' Leahy 2-deck, motor driven; 3x10' Kennedy, 3-deck; 3x5' Kennedy, single deck.

LIME HYDRATORS

Weber Sr. type, made by Arnold & Weigel with No. 1 Raymond Bros. Lime Separator; also Kritzer.
One complete Hydrated Lime Plant.

GYRATORY CRUSHERS

1—16" Telsmith.
1—20" Superior McCully.
1—27" Gates, with 100 H.P. A.C. motor.
1—No. 410-TZ Traylor, 10" feed, can be set to ½".
3—Kennedy No. 19, No. 25, No. 49.
2—Telsmith No. 2-H and No. 3-F.
1—No. 40 Telsmith, 5" feed, ⅞" discharge; also No. 40 with 40 H.P. A.C. motor.
1—13" Allis-Chalmers Superior McCully.
1—15" Austin.

HAMMER MILLS

1—#9 "Mammoth Jumbo," 48" dia. x 72" face rotor.
1—24"x20" Jeffrey Type "B".
1—32"x15" Pennsylvania, 28" dia. x 15" wide rotor.
1—24"x24" Gruendler, "Whirlbeater."
1—#4XA Gruendler, 36" dia. rotor.

CONSOLIDATED PRODUCTS CO. INC., 17-19 Park Row, NEW YORK, N. Y.

Our Shops and Yard at Newark, N. J., cover eight acres.

WILLARD MEYERS CIRCULAR SAW, with steel frame and round columns, 11' between uprights, 70" under rail, complete with 42" carborundum saw blade, direct connected thru V-belts to 20 HP A.C. G.E. motor, with 7½ HP Diehl elevating motor, friction clutch, complete starting equipment and two 3 x 12' flat cars.

WILLARD MEYERS CIRCULAR SAW, with steel frame and round columns, with 60" carborundum saw, 16' between uprights, 8' under rail, complete with 15 HP G.E. motor, direct connected to saw thru V-belts with a 5 HP G.E. driving and elevating motor, friction clutch, complete starting equipment with two 55" x 12' flat cars.

Two 76" circular diamond saw blades complete with diamond teeth insertions, one blade for ripping and the other with diamond splint teeth.

The above equipment is the balance of machinery which we have left from recent liquidation of large stone cutting plant. Reasonable offers will be considered.

J. C. BERKWIT & COMPANY
551 Fifth Ave., N. Y. VAnderbilt 6-4018

FOR SALE

35 — All Steel 50 Ton Self Clearing Side Dump Hopper Cars in repaired condition. Available for immediate inspection and delivery.

RAILWAY ACCESSORIES CO., 4100 Carew Tower, Cincinnati, Ohio

LOCOMOTIVES SHOVELS — CRANES CARS

1—67 ton Porter 6-wheel Saddle Tank, A.S.M.E. Boiler, Overhauled.
2—38 ton Vulcan 4-wheel Saddle Tanks, A.S.M.E. Boilers, Overhauled.
1—32 ton Porter 4-wheel Saddle Tank, Overhauled.

2—79 ton American 0-6-0 Separate Tender Switchers. Completely Overhauled, I. C. C. Condition, Built 1923.

1—17½ ton Brownhoist Locomotive Crane, Overhauled, New A.S.M.E. Boiler.

Crane or Dragline Fronts for Marion 37 and Bucyrus 50-B, One Each.

1—1½ Yd. Rehandling Clamshell Bucket, Practically New.

Birmingham Rail & Locomotive Co.
BIRMINGHAM, ALABAMA

FOR SALE

1—¾ yd. P&H Gas Crawler Crane—50' Boom.
1—¾ yd. P&H Gas Crawler Shovel.
1—⅝ yd. Byers "70" Crane-Dragline-Shovel and Backhoe Attachment.
1—Lorain 1 yd. Combination Crane-Shovel and Dragline—50' Boom.
1—Blaw-Knox 3½ yd. Truck Mixer.
2—Jaeger 2—2½ yd. Truck Mixers—1 with Truck.
2—Int. TD 40 wide Gauge Diesel Tractors—Garwood Bulldozer with winch and 5 yd. —4 wheel Bucyrus-Erie Scraper Wagon.
1—Cat "35" with new Bros Bulldozer.
1—IR type FM 2 Portable Wagon Drill.
1—360 ft. Chicago Pneumatic Portable Compressor.
1—310 ft. Sullivan Portable Compressor.
1—No. 50—IR Drill Sharpener.
1—No. 33—IR Drill Sharpener.
1—No. 50—IR Oil Furnace for No. 50 Drill Sharpener.
3—6" Marlow S.P. Centl. Pumps—Gas and Elec. Power.
2—3" Barnes Triplex Road Pumps—Gas.
1—4" Rex Sgle. Plunger Pump.
4—3" or 4" Carter-Humdinger Diap. Gas Pumps—sgle. or dble., open or closed discharge.

NO PRIORITY REQUIRED

SERVICE SUPPLY CORPORATION
20th and Venango Sts. Philadelphia, Pa.

Crushers, Rolls, Mills
Jaw 10x7, 15x9, 18x12, 20x10, 24x10, 36x15.
Gyratory No. 3 Gates, No. 37 Kennedy.
42x16" Traylor Rolls.
Penna. M-I Hammermill, V-belted.
No. 1½ Harosh Hammermill, 8x8" feed.

Bucket Elevators—Open & Encased
5"x35', 6"x32', 12"x35', 14"x32', 15"x50', 16"x60', 18"x40', 20"x40'.
Selected Chain, Buckets, Casings, Belt, Sprockets, Gears & Bearings.
200 Cast & Steel Drive Pulleys.

Belt Conveyors
50 Sets of H & T Pulley Assemblies.
700' of 20"-w. 8-p. Elev. Belt.
100—20" Flat Belt Idlers.

Screens
3x5, 3x6, 2x8, 4x5, 4x7' 1-deck.
5x6, 4x6, 4x7, 4x7, 4x8' 2-deck.
3x5, 4x5, 4x7 1 & 2-deck Hummers.
15-cycle Tyler Generators, 110-v.
40"x12' A-C. Revolving On Trunions.

Railway Equipment
36"-g. Gasoline Locomotives, 4 & 8-ton.
36" Easton Side Dump Cars, 2-yards.
30" Mercury Battery Locomotives, 2½-ton.
24" Portable Track, Switches & Cars.
24" Atlas V-Dump Cars, ¾ yard cap.

Contractors Equipment
Hoskins Electric Muffle Furnace.
800-hp. Patterson Feed Water Heater.
50-hp. Thomas 2-drum Electric Hoist.
15-hp. Lidg. 1-drum Gasoline Hoist.
30-hp. M-M. 1-drum Electric Hoist.
¼, ⅜, 1¼ & 1½-yd. Clamshell Buckets.
Krom 1000 Lb. Dial Scale & 35-ton Tank Scale.

G. A. UNVERZAGT
136 Coit Street Irvington, N. J.

FOR SALE

Lidgerwood Electric Single Drum Hoist 22 HP., 3 Ph., 60 Cy., 220 V.
Also Cars, Buckets, Etc.

THE INDUSTRIAL EQUIPMENT CORP.
P.O. Box 1647, Pittsburgh, Pa.
Warehouse: Carnegie, Pa.

COMPLETE STONE CRUSHING
or
SAND and GRAVEL PROCESSING SERVICES
available on tonnage basis

We will install NEW, MODERN portable or semi-portable plant in any practical location. Capacities 100 to 150 tons of stone per hour or 150 to 200 tons of sand and gravel per hour.

Estimates Furnished Without Obligation

Address
CONTRACTORS SERVICE CORP. Box 579, Harrisburg, Pa.

NEED DUMP CARS?

Immediate Delivery:
16, 24-yd. Koppel
9, 20-yd. Koppel
3, 20-yd. Western
24, 16-yd. Western
15, 16-yd. Kilbourne & Jacobs
62, 12-yd. Western
Illustrated specifications available—Other Types of Cars Too. Also Locomotives, Cranes, Shovels, Etc.

IRON & STEEL PRODUCTS, Inc.
13490 S. Brainard Ave. Chicago, Illinois
"ANYTHING containing IRON or STEEL"

ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully guaranteed. Write for List and Prices.

V. M. NUSSBAUM & CO.
FORT WAYNE, IND.

WILL BUY NOW

5—24 in. & 30 in. Conveyors.
36x48 Jaw Crusher.
4 ft. or 5½ Symons Cone Crusher.
1—20,000 or 2—10,000 gal. Tanks.
25 Ton Locomotive Crane.
50 Ton or Larger Locomotive.
2½ to 4 yd. Quarry Shovel.
20 Std. Ga. R.R. Cars.
350 to 500 H.P. Diesel Unit.
100 Ft. Boom Stiff Leg Derrick.

P. O. BOX 679
DARIEN CONNECTICUT

FOR SALE—A Good Time to Buy

Sand Lime Brick Plant 2 kilns 72'x80" with cars —molds—pulverizer.
Shovels 100B—37M—both electric.
Guy derricks 50 and 65 ton.
Cone Crushers 3 ft. and 4 ft. Symons.
Gyr. Crushers 6K-8K-9K, 10K-18N.
Clam Buckets 1 yd.—2 yd.—3 yd.

A. V. KONSBERG
111 W. Jackson Blvd., Chicago

FOR SALE

Bucyrus Steam Dragline, 70 ft. boom 2 yard Page Dragline bucket. Completely overhauled in 1936. Used 2 summers since. Very good running condition. Price $15,800 net as is, where is. Near Chicago.

MORTON SAND & GRAVEL COMPANY
310 S. Michigan Avenue Chicago, Illinois

FOR SALE—MIXER TRUCKS

11—Units Heavy Duty Contractor's Equipment.
2—1½ yd. Jaegers Mounted on A B Mack Chassis.
5—2½ yd. Jaegers Mounted on A C Mack Chassis.
Above Units Equipped with Jackass Hoists for high Discharge.
4—4 yd. Rex's Mounted on A K Mack Chassis.
All Above Equipment now in operation.

P. O. Box 1663
Buena Vista Station Miami, Fla.

GOOD VALUES

No. 7 Newhouse Gyratory—60 HP Motor.
¾ Yd. Northwest. 1 Yd. P&H Crawler Cranes.
20 and 30 ton 8 wheel Locomotive Cranes.
Motor and Diesel Driven Air Compressors.
30 ton Plymouth Gasoline Locomotive.
50 HP to 800 HP Diesel Engines and Generators.

MISSISSIPPI VALLEY EQUIPMENT CO.
513 Locust St. St. Louis, Mo.
Hoists—Derricks—Cars—Boilers—Engines

WANTED TO PURCHASE

Boilers, shovels, cranes, draglines, asphalt plants, gravel plants. We buy all types of used contractor's machinery. Let us know what you have for sale. Send for our bulletin for your equipment requirements.

THE ACME EQUIPMENT COMPANY
14057 Schaefer Highway Detroit, Michigan

FOR SALE

As is—or—for parts
Allis-Chalmers
8K & 6D
Gyratory Crushers

M. S. ROSEN
Stil. 4-3024 G.P.O. Box 297, N.Y.C.

FOR SALE

Motor Truck Scales and Vibrating Screens. New and used. Liberal terms. Thousands of satisfied users. Scale repairs for all makes.

Distributors and salesmen. Some choice territory still available.

BONDED SCALE CO.
Dept. PQ
COLUMBUS OHIO

WANTED

Contractor to quarry limestone and deliver to mill adjacent. Sized 6 inch and under. Must furnish all tools. I can furnish air if necessary.

P. O. BOX 127
Robbs, Illinois

DEPENDABLE USED MACHINES

Amsco 10" sand pump; 250 HP motor.
Iowa port. crushing & screening plant.
3x6 and 4x8 vibrator screens.
Conveyors, 18" and 24"; various lengths.
Webster sand tanks.
Heil 6 yd. Dig'N'Carry scraper.
P&H ¾ yd. shovel; rebuilt.

TRACTOR & EQUIPMENT CO.
3515 West 51st St. Chicago

ROCK CRUSHERS portable and stationary. 5 to 200 Tons per hour capacity.
REPAIR PARTS for all Acme Road Machinery Company products.

ACME ROCK MACHINERY CORPORATION
Frankfort, New York, U. S. A.

WANTED

Wisconsin manufacturer of rock, ore and gravel handling machinery wants engineer to design portable crushing plants. Permanent position for right man. Give age, complete outline of experience and salary expected.

Address BOX 303
PIT AND QUARRY PUBLICATIONS
538 S. Clark St. Chicago, Ill.

SPECIALS

33"x33" Link-Belt Roll Crusher.
150 HP. F-M Diesel Eng. Like New.
150 HP. Economic Boiler; ASME.
1¼ Yd. Bucyrus Full Diesel Shovel.
30'x30' Portable Steel Building.

H. & P. MACHINERY COMPANY
5819 Enright Ave., St. Louis, Mo.
Diesel Engines—All Makes and Sizes.

QUARRY EQT. FOR SALE

1—Insley Type R-½-yd. combination Dragline and Shovel.
1—each Williams, Gruendler Hammer Mills.
2—I.H.C. Gas, Power Units.
Sullivan Air Compressor and Drills.

GILLIS QUARRY
H. G. Gillis Chester, Ill.

WANTED

Sales Engineer—Experienced in layout and estimating of conveying equipment as used by contractors in handling of sand, gravel and other materials. Sales experience desired.

BARBER-GREENE COMPANY
Aurora, Illinois

FOR SALE

8x36 Universal Crusher.
20x14 Allis Chalmers roll Crusher.
¾ yd. Osgood drag line.

THE SAWTOOTH COMPANY
Boise, Idaho

FOR SALE

1—No. 5 AUSTIN Gyratory Crusher, 12" opening, with babbitting mandrels. Cheap before removal.
1—4½" TRAYLOR Gyratory Crusher, Type T.

JOHNSON & HOEHLER, INC.
Lansdowne, Pa.

WANTED

One good used 10 inch feed Gyratory Crusher. Give full description, condition and price. Address replies to

SUBURBAN INDUSTRIES, INC.
P. O. Box 511 Ardmore, Penna.

FOR SALE

1—American Hoist, 2 drum, Dragline, ½ yd. Sauerman Scraper
1—Telsmith Screw Stone Washer
1—Case Jaw Crusher
1—Telsmith Shaker Feeder
1—35' Belt Bucket Elevator
Electric motors ranging from 5 H.P. to 30 H.P. Starters and switchboxes, 3 phase, 60 cycle, 220 volts.

SHEBOYGAN SAND & GRAVEL CO.
19th St. at Ashland Ave. Sheboygan, Wis.

1—CLIMAX MOTOR, Model R6U, 6x7 cylinders, 150 Horsepower.
1—Waukesha Motor, Model WL 340, 6¼x8 cylinders, 125 Horsepower.
Both units equipped with TWIN DISC CLUTCHES, and mounted on skids.

Ready to Go and Priced Right
INDIAN POINT STONE QUARRY
R. R. No. 2 Athens, Ill.

FOR SALE

18" x 36" Stevenson Single Roll Crusher.
9" x 36" Wheeling Jaw Crusher.
9" x 15" Phillips Jaw Crusher.
#4 Champion Jaw Crusher.
#1 Williams Hammermill Crusher.

PITTSBURGH MACHINERY & EQUIPMENT CO.
Aspinwall Pennsylvania

FOR SALE

Orr & Sembower 2 drum hoist, Waukesha gasoline drive, and ¾ yd. Sauerman crescent bucket. $600.00 cash takes both.

FRED H. ELDREDGE
Homer, N. Y.

FOR SALE

IMMEDIATE DELIVERY

2—Kent Ring Roll Mills, #3, perfect condition.
3—General Electric 30 KW, Gasoline Eng., Generators 115 Volts, D.C.
Electric Motors, 10-HP. to 125 HP. Slow speed, 3 phase, 60 cycles, 440 volts.

BURTON MACHINE CO., INC.
P.O. Box 191, Berkley Norfolk, Va.

RELAYING RAILS

All sections new and relaying rail, spikes, bolts, frogs, switches, "V" Shaped, flat and Contractors' Cars, etc. Prices cheerfully quoted.

M. K. FRANK
480 Lexington Ave., NEW YORK CITY
25 St. Nicholas Bldg., PITTSBURGH, PENNA.

Double Roll Crushers: Traylor 30x30, Webb City 30x14, Buchanan 14x30 & McLanahan 18x20.
Gyratory Crushers: Traylor Bulldog 12x46, Allis-Chalmers 6, 9 & 10K, Kennedy No. 19 & 37.
2' Symons Cone—3x8' Jigger 3-deck Vib. Screen.
Jaw Crushers: 15x36 Universal, 42x48 Traylor.
Barber-Greene Loaders: 24, 25, 42, 62 & 82.
¾ yd. Northwest Cat. Elec. Shoval 35' boom, 440V.
Rotary Dryers, direct heat—65"x50' and 6-7'x70'.
1½, 2, 3 and 4 yd. Koppel all-steel V-shape cars.
Four 4 yd. Koppel heavy duty Quarry Cars.
4x5' Hummer single deck Vib. Screen and Generator.

MID-CONTINENT EQUIPMENT CO.
710 Eastgate Pa. 2290 St. Louis, Mo.

FOR SALE or RENT

Hoisting engines, double drum, Gasoline, 15 H.P. to 90 H.P.
Derricks, all guy.
Derricks, Stiff-leg, Booms to 90-0.
Misc. small construction equipment.

THOMAS ROME INC.
8860 76th Avenue Glendale, L. I.

FOR SALE

1—Farrell jaw crusher, size 15x24.
1—International Power Unit 60 horsepower.
1—Tarvin Pulverizer.
1—Chicago Pneumatic air compressor.
1—20 ft. portable conveyor.
1—Gardner-Denver jack hammer.
All equipment in A-1 condition

RAYMOND HEFFNER
Box 61 McConnellstown, Pa.

SHOVELS & DRAGLINES

1—Model 908 Long Crawler Wide Tread Osgood Dragline, 75′ Boom, 2 yard Page Bucket, Buda Diesel Engine. A-1 condition.

1—Model 601 Lima Combination 1½ yard Shovel and 60′ Crane Boom equipment with D-13000 Caterpillar Diesel Engine. Excellent condition.

1—Lima 1001 Long Crawler Dragline, 80′ Boom, 2½ yard bucket, EKH Hesselman Oil Burning Engine. Excellent condition.

1—Lima 1201 Long Crawler Dragline, 85′ Boom, 3 yard bucket, NKH Hesselman Oil Burning Engine. Two years old. Excellent condition.

1—Model 900 P&H Dragline, 100′ Boom, 3½ yard Page bucket. 5 Cylinder Fairbanks-Morse Diesel Engine. Machine completely overhauled. A-1 condition.

All these machines located in Pennsylvania.

FRANK SWABB EQUIPMENT CO.
Hazelton, Pa.

FOR SALE—REBUILT EQPT.

BAY CITY Model "S" combination 1 yd. shovel, crane & dragline.
UNIVERSAL-LORAIN Mod. 35—½ yd. comb. shovel, crane, dragline.
P & H Model 450—1 yd. Shovel.
KOEHRING #1—¾ yd. crane & dragline. Can furnish ¾ yd. Shovel Front.
HEYWARD—1¼ yd. clam shell bucket.
WILLIAMS—½ yd. clam shell bucket.
INDUSTRIAL WORKS—25 Ton—8 wheel steam Loco. crane—50 ft. boom.
WHITCOMB Model CS-4—4½ Ton 24" Gauge Gasoline Locomotive.
3—PLYMOUTH Model FL-4 ton 24" Gauge Gasoline Locomotives.
DAVENPORT 22 Ton—4 Wheel saddle tank Type—Std. Ga. Loco. Cyl.—11"x16".
VULCAN—33 ton—4 wheel saddle Tank Type—Std. Ga. Loco. Cyl.—13"x18".
CH&E #11—Triplex Road Pump.
NOVO—40 H.P. Gasoline D.D. Hoist.
CARRY-ALL TRAILERS—10 to 30 Ton.
10—BUDA Model 119 and Model 19-L motor section cars for standard gauge track, Buda air cooled gasoline motor.

Other Type of Equipment, Too

SOUTHERN IRON & EQUIPMENT COMPANY
Plant and General Offices:
ATLANTA, GEORGIA

FOR SALE

Smith 56-S Tilting Type Concrete Mixer, 2 cubic yard capacity, excellent condition.

Smith 28-S one cubic yard capacity Concrete Mixer, excellent condition.

Williams type P.C. material handling 1½ cubic yard capacity clamshell bucket, excellent condition.

E. E. FORT
1119 S. 56th St. Philadelphia, Pa.

STANHOPE OFFERS!

AIR COMPRESSORS
BELTED: 355, 528, 676, 1000, 1300 & 1570 Ft.
ELECTRIC: 478, 676, 807, 1302, 1722 & 2850 Ft.
DIESEL: 105, 315, 420, 603, 807 & 1000 Ft.
PORTABLE GAS: 110, 160, 220, 310, 540 & 1300 Ft.
STEAM: 49, 310, 528, 1300 & 2200 Ft.

BUCKETS
50 Skips and Battleship Type, 2 to 6 Yds.
5 Owen & Bucyrus Rock Grabs.
CLAMSHELL: ½, ¾, 1, 1½ & 2 Yds.
ORANGE PEEL: ¾, 1, 1½, 2 & 3 Yds.
DRAGLINE: ½, ¾, 1, 1½ & 2 Yds. Cap.

CRANES & DRAGLINES
5 Ton BROWNHOIST, 30 Ft. Boom Gas.
12 Ton NORTHWEST 50 Ft. Boom Gas.
12 Ton KOEHRING 45 Ft. Boom Gas.
10 Ton Speedcrane, Gas, 50 Ft. Boom.
25 Ton BROWNING & 30 Ton AMERICAN Locomotive.
25 Ton LINK BELT K-48 Electric, 70 Ft. Boom.
2½ Yd. Lorain Model 95, Diesel Dragline.

CATERPILLAR SHOVELS
½ Yd. P. & H. Gas & ¾ Yd. Insley Gas.
¾ Yd. KOEHRING Gasoline.
¾ Yd., 1¼ Yd., 2 Yd., 4 Yd. & 8 Yd. MARION Electrics.
1 Yd. NORTHWEST Gas & 7/8B2 Steamer.
1¼ Yd. BUCYRUS 41B Steamer.
1½ Yd. Lima 750 Diesel.
1½ Yd. KOEHRING 601—Gas.

OIL DISTRIBUTORS' TRUCKS
3—1000 gal. ETNYRE Mack.

DUMP CARS
46—KOPPEL 1½ Yd., 24 & 30 In. Ga., V Shaped.
15—2 Yd., 3 Yd., 4 Yd. 36 In. Ga.
20—Std. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.

BALL, ROD AND TUBE MILLS
6x8 Continuous Pebble Mill.
5x5 Batch Mill.
5′x22" HARDINGE CONICAL Dry Ball Mill.
6′x22" HARDINGE CONICAL Pebble Mill.
4x8, 8x6, & 10x9 Straight Ball Mills.
8′x22" HARDINGE CONICAL Ball or Pebble Mill.
4x16, 5x18, 5x22, & 6x22 Tube Mills.
3½x8 & 5x7 Air Swept Tube Mills.
2x4½, 5x12 and 6x12 ROD MILLS.
4x16 Smidth Tube Mill Silex.
5½x20 Smidth Tube Mill Mang. Lining.
5½x18 P & M Tube Mill Silex.

PULVERIZERS
No. 1 Sturtevant Ring Roll.
RAYMOND Auto. Pulverizer No. 0000, 0 & 3.
RAYMOND Imp Mills No. 4, 32 & 55.
GRUENDLER XXB Mill & Jay Bee No. 3 & 4.
RAYMOND 4 & 5 ROLL MILLS & 5 Ft. Chaser Mill.

SEPARATORS AND COLLECTORS
14 ft., 8 ft. and 12 ft. Separators

ROLL CRUSHERS
36x60 Fairmont Single Roll.
36x20 Diamond Double Roll.
24x24 & 36x16 & 36x20 Diamond Double Roll.

JAW CRUSHERS
10x8, 13x7¼, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x6, 20x10, 20x12, 20x11, 26x12, 30x15, 30x13, 36x30, 36x18, 36x14, 36x15, 36x9, 36x6, 38x18, 36x10, 36x24, 42x9, 48x36, 60x42, 84x66, 36x16, 9x36.
30x10 Gruendler Roller Bearing.

CONE & GYRATORY CRUSHERS
18 in., 24 in., 30 in., 36 in. and 48 in. Symons Disc.
21K & 18N Allis Chalmers.
4—10 TZ Traylor 4 Ft. Gyratory.
4—Nos. 5, 5 S & 6 Austin Gyratory.
2—Traylor T-12 Bulldog Gyratory.
8 in. Traylor T. Gyratory, Telsmith No. 9.
17 Gates K—Nos. 3, 4, 5, 6, 7½, 8 & 9½.
10 Inch Austin Model 103.
6, 10 & 13 Inch Superior McCullys.
KENNEDY: Nos. 19, 25, 27, 39 & 49.
16" Traylor.
7 Ft., 5 Ft. and 3 Ft. Symons Cone.

DRILLS
4—SANDERSONS 14 & LOOMIS 44.
7—Ingersoll-Rand Wagon Drills, FB & M2.
29T ARMSTRONG Well Drill.

HOISTING ENGINES
7 Gasoline 15, 40, 60 & 100 H.P.
17 Steam 7x10, 8½x10 and 10x12.
8 Electric 20, 35, 50, 60, 100 & 150 H.P.

HAMMER MILLS
4 Jeffreys: 24x18-A, 36x24-B, 42x36-E & 42x48-B.
Williams No. 1 Jumbo Jr., & No. 6 Universal.
Nos. 4, 6 & 8 Williams Jumbo.
No. 36 Am. Ring Roll.
Gruendler No. 6X.

STEEL BINS
72 Ton BLAW-KNOX 2 Compt.; also 250 ton.
100 Ton BLAW-KNOX 2 Compt.

CEMENT BIN
400 Bbl. Portable BUTLER Bulk Cement Bin with Fuller Full Automatic Electric Push Button Weigh Batcher.

SYNCHRONOUS MOTOR GENERATORS
100 K.W. RIDGWAY 3 /60 /2200-250-275 volt.
150 K.W. GEN. ELEC. 3 /60 /2200-250-275 volt.
200 K.W. RIDGWAY 3 /60 /2200-250-275 v., 900 rpm.

DIESEL GENERATORS
240 K.W. F.M. 3 /60 /2300 v.
300 K.W. Worthington 3 /60 /2400 v.
125 K.W. F.M. 250 v. D.C.

RAYMOND MILL
5 Roll High Side.

CONVEYOR PARTS
BELT: 1000 Ft. 60 In., 700 Ft. 42 In., 600 Ft. 36 In., 800 Ft. 30 In., 1642 Ft. 24 In., 517 Ft. 20 In., 297 Ft. 18 In., 1000 Ft. 14 In. & 16 In.
IDLERS: 36 In., 30 In., 24 In., 20 In., 18 In.
Head—Tail—Pulleys—Takeup for all sizes.
Steel Frames: 2,000 Ft. 24 In., 30 In. & 36 In. Sections.

ROTARY DRYERS AND KILNS
36 In. x 20 Ft., 3 Ft. x 30 Ft., 4 Ft. x 30 Ft., 54 In. x 30 Ft., 42 In. x 24 Ft., 5 Ft. x 30 Ft., 5 Ft. x 16 Ft., 5 Ft. x 60 Ft., 6 Ft. x 60 Ft., 6 Ft. x 70 Ft., 70 In. x 40 Ft., 5x30 & 8x84 Double Shell Dryers, 8x110, 7½x100, 8x125 & 10x20 Kilns.

STEEL DERRICKS
GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 20 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

LOCOMOTIVES
DIESEL: 7—4½, 8 and 15 Ton 36 & 42 In. Ga.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14 & 30 Ton.
STEAM: 9 Ton, 20 Ton, 40 Ton, 60 Ton & 80 Ton.
ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

SCREENS
VIBRATING: 2x4, 3x6, 2x8, 3x8, 3x5, 4x5, 4x8, 4x10, 48x72. HUMMER, ROTEX, NIAGARA & ROBINS. LINK BELT & HURON.
REVOLVING: 3x12, 3x16, 3½x18, 3x24, 4x16, 4x20, 4x23, 4x24, 5x30, 5x36, 6x20.

SAND WASHERS AND CLASSIFIERS
4 LINK-BELT A-60 In. Classifiers.
7 ALLEN Cones 4 Ft., 5 Ft., 6 Ft., 8 Ft.
30" Reciprocating Plate Feeder.

RAILROAD CARS
12—50 Ton Cap. Battleship Gondolas.
7—50 Ton Cap. Flat Cars.

SAUERMAN DRAG AND SLACKLINES
1—¾ yd. Gas 1—1½ yd. Electric
1—1 yd. Electric 3—2 yd. 3 yd. & 4 yd. Electric

42 IN. BELT CONVEYOR
350 Ft. Barber-Greene Sectional Steel Frame Roller Bearing Belt Conveyor. New 1939.

JACK HAMMERS AND DRIFTERS
21 Worthington 169 Drifters.
12 Worthington 180 Drifters.
6 Gardner-Denver 15 Jackhammers.
45 Ingersoll-Rand Drifters S70, N75, X71, DA35.
11 Ingersoll-Rand S49 Jackhammers.

R. R. TRACK SCALE
125 Ton 56′ x 10′6" Platform 4 Section.

WHIRLEY CRANES
5 Clyde 75 to 100 Ft. Boom.

DRILL SHARPENERS
5 I.R. 4K Shank Grinders.
6 Ingersoll-Rand 54, 40, 50 & 34's.
7 Sullivan Class A & C.
8 Gardner-Denver 3A & No. 6DS.

CONE CRUSHERS
Symons No. 5½ and 7 Ft.

R. C. STANHOPE, INC.
(Cable Address: "STANEQUIP" New York)
Lincoln Bldg., 60 E. 42nd St., New York, N. Y.
Murray Hill 2-3075 or 2-3076

IMMEDIATE SHIPMENT
LOW PRICES

NEW RUBBER

GUARANTEED
HIGH GRADE

CONVEYOR and TRANSMISSION BELTING

CONVEYOR BELTING ABRASIVE RESISTANT COVERS

Width	Ply	Top & Bottom Covers
48"	— 8	— 1/8" — 1/16"
42"	— 5	— 1/8" — 1/16"
36"	— 6	— 1/8" — 1/16"
30"	— 6	— 1/8" — 1/16"
30"	— 5	— 1/8" — 1/16"
24"	— 5	— 1/8" — 1/32"
24"	— 4	— 1/8" — 1/32"
20"	— 5	— 1/8" — 1/32"
20"	— 4	— 1/8" — 1/32"
18"	— 4	— 1/8" — 1/32"
16"	— 4	— 1/8" — 1/32"
14"	— 4	— 1/16" — 1/32"
12"	— 4	— 1/16" — 1/32"

TRANSMISSION BELTING HEAVY-DUTY— FRICTION SURFACE

Width	Ply	Width	Ply	Width	Ply
18"	—6	10"	—6	6"	—5
16"	—6	10"	—5	5"	—5
14"	—6	8"	—6	4"	—5
12"	—6	8"	—5	4"	—4
12"	—5	6"	—6	3"	—4

ELEVATOR BELTING HEAVY DUTY— RUBBER COVERED

Width	Ply	Top & Bottom Covers
12"	— 6	— 1/16" — 1/16"
14"	— 6	— 1/16" — 1/16"
16"	— 6	— 1/16" — 1/16"
18"	— 6	— 1/16" — 1/16"

ENDLESS "V" BELTS

"A"—WIDTH—All Sizes
"B"—WIDTH— " "
"C"—WIDTH— " "
"D"—WIDTH— " "
"E"—WIDTH— " "
Sold in Matched Sets

RUBBER HOSE
ALL SIZES FOR
AIR — WATER — STEAM — SUCTION — FIRE — WELDING ETC.

INQUIRE FOR PRICES :—: MENTION SIZE AND LENGTHS

CARLYLE RUBBER CO., Inc.
62 PARK PLACE NEW YORK, N. Y.

4 OFFICES and PLANTS

CHICAGO	NEW YORK
3155 S. Washtenaw Ave.	30 Church St., Dept. ENR
PITTSBURGH	PHILADELPHIA
P. O. Box #933, Dept. ENR	1503 Race St.

EQUIPMENT CORPORATION of AMERICA

WE SERVE 4 WAYS

BUY	REBUILD
SELL	RENT

4

OWEN
CLAMSHELL BUCKETS
INSURE A BIGGER DAY'S WORK
YES ··· THEY'RE ALL OWEN BUCKETS
The OWEN BUCKET Co
6050 Breakwater Ave., Cleveland, O.
BRANCHES: NEW YORK, PHILADELPHIA, CHICAGO, BERKELEY, CAL.

Index to Advertisers

Allan Mfg. & Welding Co., Inc. 114
*Allis Chalmers Mfg. Co. 12-13
American Cable Div. American Chain & Cable Co., Inc., Inside Back Cover
*American Chain & Cable Co., Inc., 23-Inside Back Cover
American Cyanamid & Chemical Corp. 18-19
American Manganese Steel Co. 93
*American Pulverizer Co. 125
*American Steel & Wire Co. 33
Anchor Concrete Machy. Co. 108
Atlantic Equipment Corp. 126
Atlas Powder Co. 26
*Austin-Western Road Machy. Co. 28

*Babcock & Wilcox Company 10
Bacon, Inc., Earle C. 96
*Barber-Greene Co. 99
Barrett-Cravens Co. 113
Baughman Mfg. Co. 118
Berkwit & Co., J. C. 129
*Bethlehem Steel Co. 17
Birmingham Rail & Loco. Co. 129
Brill Equipment Corp. 127
Broadcast Section 126-131
*Brooks Equipment & Mfg. Co. 99
Buckeye Traction Ditcher Co. 35
Burnham, Royal E. 128
*Butler Bin Company 115

Carlyle Rubber Co., Inc. 131
Caterpillar Tractor Co. 29
Chase Foundry & Mfg. Co. 114
Chicago Perforating Co. 94
*Chicago Pneumatic Tool Co. 119
Cleveland Wire Cloth & Mfg. Co. 124
Coast Metals, Inc. 123
*Colorado Iron Works Co. 120
Consolidated Products Co., Inc. 129
*Cooper-Bessemer Corp. Back Cover

Davenport Locomotive Works 125
*Deister Concentrator Co. 100
*Deister Machine Co. 90
*Dempster Bros., Inc. 15
*Denver Equipment Co. 124
DeWitt Hotels 114
*Diamond Iron Works, Inc. 92
*Dixie Machy. & Mfg. Co. 120
Dunn Mfg. Co., W. E. 122

*Eagle Iron Works 118
*Easton Car & Construction Co. 1
*Ensign-Bickford Co., The 14
Equipment Corporation of America 127-131
*Euclid Road Machy. Co. 5

Flexible Steel Lacing Co. 123
Frog, Switch & Mfg. Co. 96
*Fuller Co. 27

Gardner-Denver Co. 122
Gates Rubber Co., The 6
Gay, Rubert M., Div. Universal Road Machy. Co. 117
*General Electric Co. 9
General Excavator Co., The 120
Gruendler Crusher & Pulverizer Co. 100-126

*Haiss Mfg. Co., Inc., Geo. 96
*Hardinge Company 88
*Hazard Wire Rope Div. American Chain & Cable Co., Inc. 23
*Hendrick Mfg. Co. 124
Hoffman Bros. Drilling Co. 128
Hotel Mayfair 100
Hotel Philadelphian 112

Industrial Brownhoist Co. 95

*Jackson & Church Co. 112
*Jaeger Machine Co. 111
*Jeffrey Mfg. Co. 114
Johnson Co., C. S. 113
Jones Foundry & Machine Co., W. A. 11
*Jones & Laughlin Steel Corp. 125

Kansas City Hay Press Co. 124
Kent Machine Co. 108
Keystone Driller Co. 97
Kirk & Blum Mfg. Co. 108

*Laughlin Co., Thomas 86
LeTourneau Inc., R. G. 21
Lima Locomotive Works, Inc. 117
Lime Industry Management & Engineering 88
*Link-Belt Co. 123
Ludlow-Saylor Wire Co. Inside Front Cover

MacMillan Petroleum Corp. 2
*McLanahan & Stone Corp. 124
*Merrick Scale Mfg. Co. 98
Miles Mfg. Co., The 113
Mine & Smelter Supply Co. 32
*Morris Machine Works 91
*Multiplex Concrete Machy. Co. 101

National Powder Co. 87
National Supply Co., The 30
Naylor Pipe Company 119
Neff & Fry Company 112
New Holland Machine Co. 88
*Nordberg Mfg. Co. 22

*Owen Bucket Co. 132

Page Engineering Co. 121
*Parsons Engineering Co. 121
Patterson Equipment Co. 128
Pennsylvania Drilling Co. 128
Pettibone Mulliken Corp. 25
*Pioneer Engineering Works 20
Porter Co., H. K. 96

*Quaker Rubber Corp. 34
Quinn Wire & Iron Works 114

Railway Accessories Co. 129
*Raymond Pulverizer Div. of Combustion Engineering Co., Inc. 36
*Robins Conveying Belt Co. 38
*Roebling's Sons Co., John A. 97

Samler, Inc., Arthur D. 126
*Sauerman Bros., Inc. 115
Schaffer Poidometer Co. 94
*Screen Equipment Co., Inc. 95
Service Supply Corp. 129
Simplicity Engineering Co. 118
*Sly Manufacturing Co., W. W. 85
*Smidth & Co., F. L. 16
Smith Engineering Works 31
Southern Iron & Equipment Co. 131
Sprout, Waldron & Co., Inc. 124
Stanhope, Inc., R. C. 131
*Stearns Mfg. Co. 116
Stonex Industries 108
*Sturtevant Mill Co. 7
Superior Engine Div. 00
Swabb Equipment Co., Frank 131
*Syntron Company 115

Talcott, Inc., W. O. & M. W. 125
Taylor Forge & Pipe Works 8
Thew Shovel Co. 3
*Traylor Engineering & Mfg. Co. 89
Twin City Iron & Wire Co. 124
*Tyler Co., The W. S. 98

U. S. Treasury Department 4
Universal Crusher Co. 24
Universal Road Machy. Co. 117
Unverzagt, G. A. 129

Walsh Co., R. P. 126
Wellman Engineering Co. 32
*Williams Pat. Crusher & Pulverizer Company 132
Wisconsin Motor Corp. 123

***See also Detail Information in the 1942 Pit and Quarry HANDBOOK**

for Making 1¼", ¾" or Agricultural Limestone...

THE WILLIAMS "SLUGGER" CRUSHER AND PULVERIZER

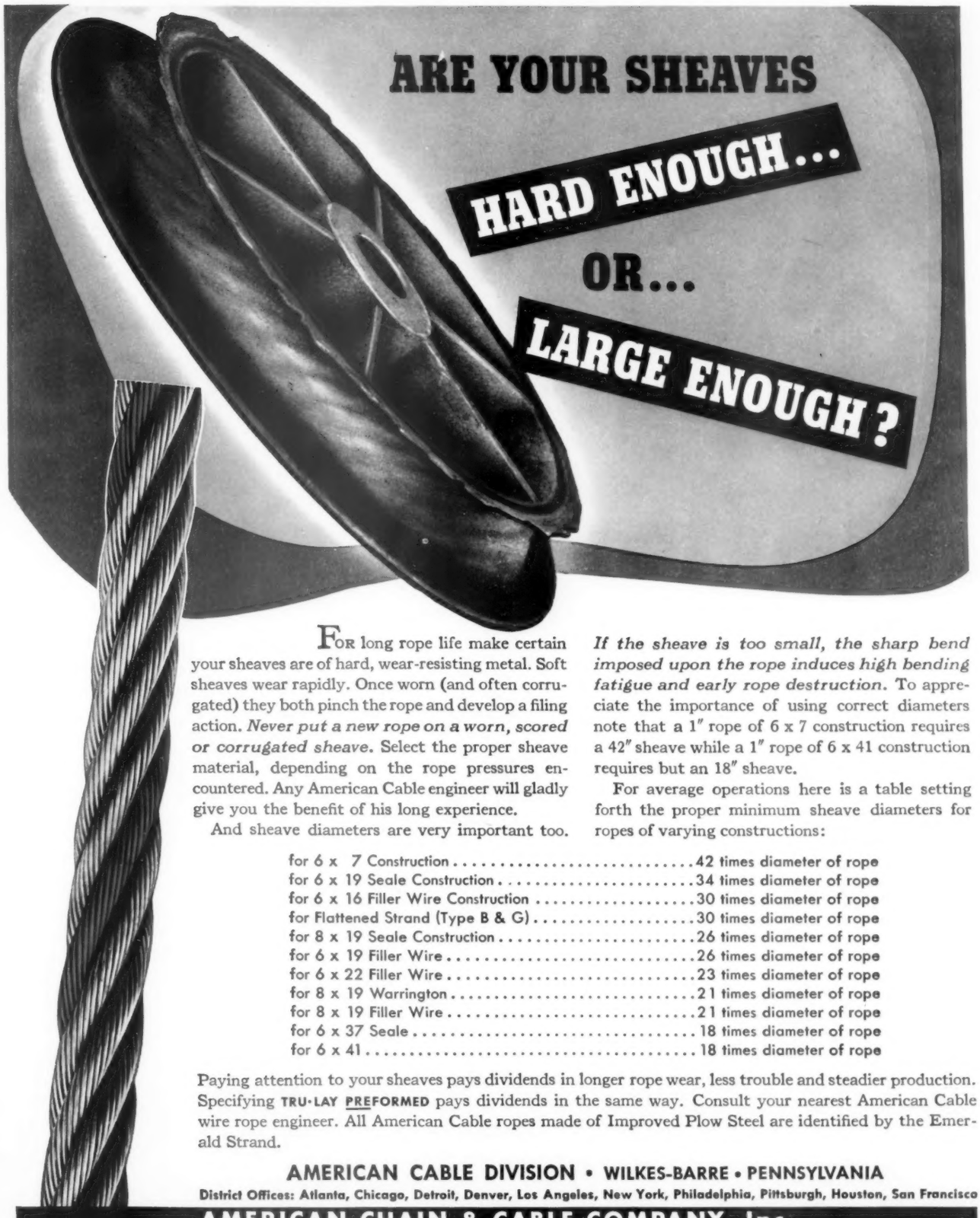
● Handles Large Stone or Screen Rejects ●

Rows of heavy, free swinging, fast revolving hammers, crush the material by impact until of proper size to pass through the grates. By reducing large rock to 1¼", ¾" or agricultural size in one operation, the "Slugger" has enabled operators to produce these sizes at a very low cost per ton and with small investment. Seven sizes—6 to 150 tons hourly capacity.

The Williams Patent Crusher and Pulverizer Co.
802 St. Louis Ave. St. Louis, Mo.

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD
Williams
PATENT CRUSHERS GRINDERS SHREDDERS

AIR SEPARATORS
ROLLER MILLS
CRUSHERS
GRINDERS
SHREDDERS



FOR long rope life make certain your sheaves are of hard, wear-resisting metal. Soft sheaves wear rapidly. Once worn (and often corrugated) they both pinch the rope and develop a filing action. *Never put a new rope on a worn, scored or corrugated sheave.* Select the proper sheave material, depending on the rope pressures encountered. Any American Cable engineer will gladly give you the benefit of his long experience.

And sheave diameters are very important too. *If the sheave is too small, the sharp bend imposed upon the rope induces high bending fatigue and early rope destruction.* To appreciate the importance of using correct diameters note that a 1" rope of 6 x 7 construction requires a 42" sheave while a 1" rope of 6 x 41 construction requires but an 18" sheave.

For average operations here is a table setting forth the proper minimum sheave diameters for ropes of varying constructions:

for 6 x 7 Construction	42 times diameter of rope
for 6 x 19 Seale Construction	34 times diameter of rope
for 6 x 16 Filler Wire Construction	30 times diameter of rope
for Flattened Strand (Type B & G)	30 times diameter of rope
for 8 x 19 Seale Construction	26 times diameter of rope
for 6 x 19 Filler Wire	26 times diameter of rope
for 6 x 22 Filler Wire	23 times diameter of rope
for 8 x 19 Warrington	21 times diameter of rope
for 8 x 19 Filler Wire	21 times diameter of rope
for 6 x 37 Seale	18 times diameter of rope
for 6 x 41	18 times diameter of rope

Paying attention to your sheaves pays dividends in longer rope wear, less trouble and steadier production. Specifying TRU-LAY PREFORMED pays dividends in the same way. Consult your nearest American Cable wire rope engineer. All American Cable ropes made of Improved Plow Steel are identified by the Emerald Strand.

AMERICAN CABLE DIVISION • WILKES-BARRE • PENNSYLVANIA

District Offices: Atlanta, Chicago, Detroit, Denver, Los Angeles, New York, Philadelphia, Pittsburgh, Houston, San Francisco

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT • CONNECTICUT

ESSENTIAL PRODUCTS . . . AMERICAN CABLE Wire Rope, TRU-STOP Emergency Brakes, TRU-LAY Control Cables, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Iron Castings, CAMPBELL Cutting Machines, FORD Hoists and Trolleys, HAZARD Wire Rope, Yacht Rigging, Aircraft Control Cables, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

THE COOPER-BESSEMER CORPORATION

MACHINERY BUILDERS — ENGINES AND COMPRESSORS — SINCE THE YEAR 1833

MT. VERNON, OHIO

P O W E R ! M O R E P O W E R !

In every period of national emergency since 1833, our company has heard that call ... and heeded it!

Today, the urgent call for Power - More Power is being sounded again ... and we are furnishing it! Diesel engines for ships and locomotives, gas and diesel engines for industrial and municipal power plants, engine and motor-driven compressors for the refining and transportation of fuels and oils, and for the important process industries ... these are our answers to the need!

Every engineering and production facility of this company's plants and workers is being devoted to the needs of our government and our valued commercial customers. As in every previous period of national emergency, this company's products will advance with the crisis ... in the skill of their building, in their increased efficiency, in their dependability!

We have put our shoulders to the increasing task of Power for Defense. To our customers in the marine, petroleum, industrial and municipal power fields we say, "This is <u>our</u> job today. This is <u>your</u> guarantee of even better engines and compressors today and tomorrow!"

Yours very truly,

THE COOPER-BESSEMER CORPORATION